27-31 October 2019
Basel+Switzerland

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

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CONFERENCE AT A GLANCE

SUNDAY, 27 OCTOBER			
08:30	Workshop Registration		
09:00 - 17:00	Morning and Afternoon Workshops		
17:00 -19:00	Conference Registration and Check-In		
17:00 -19:00	Wine and Cheese Welcome Reception		

MONDAY, 28 OCTOBER			
07:00 - 18:15	Registration		
08:00 - 08:30	Opening Remarks		
08:30 - 09:15	**PLENARY PRESENTATION I** James R. Heath – *Institute for Systems Biology* *Seattle, USA*		
09:15 - 09:30	Transition		
09:30 - 10:30	**SESSION 1A1** Exosomes Trapping and Isolation	**SESSION 1B1** Particle Separation	**SESSION 1C1** Synthetic Biology Using Droplets
10:30 - 11:00	Break: Exhibit and Poster Inspection		
11:00 - 12:20	**SESSION 1A2** Single Cell Analysis (Secretion)	**SESSION 1B2** Reconfigurable & Self-Powered Dev.	**SESSION 1C2** Separation and Assays in Droplets
12:20 - 13:10	Grab 'n Go Lunch		
13:10 - 13:15	Analytical Chemistry – Young Innovator Award Presentation		
13:15 - 14:00	**PLENARY PRESENTATION II** Keisuke Goda – *University of Tokyo* *Tokyo, JAPAN*		
14:00 - 16:30	Poster Session 1 and Exhibit Inspection		
16:30 - 18:00	**SESSION 1A3** Single-Cell Analysis	**SESSION 1B3** Organs on Chip	**SESSION 1C3** Genetic Engineering
	KEYNOTE PRESENTATION **Angela Wu**	**KEYNOTE PRESENTATION** **Adrian Roth**	**KEYNOTE PRESENTATION** **Randall J. Platt**
18:00 - 19:30	MicroTAS Student Mixer		
18:00	Women's Faculty Event		

TUESDAY, 29 OCTOBER			
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** Culture for Cells, Organisms & 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)		
14:00 - 16:30	Poster Session 2 and Exhibit Inspection		
16:30 - 18:00	**SESSION 2A3** Circulating Tumor Cells	**SESSION 2B3** Immunoassays and POC Devices	**SESSION 2C3** Nanochannels
	KEYNOTE PRESENTATION **Catherine Alix-Panabières**	**KEYNOTE PRESENTATION** **Dhananjaya Dendukuri**	**KEYNOTE PRESENTATION** **David Sinton**

CONFERENCE AT A GLANCE

WEDNESDAY, 30 OCTOBER			
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** Pathogen Detection & Analysis	**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)		
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)		
16:00	**Exhibitor Raffle** (in Zurich Instruments Booth # 7 - Ground Floor)		
16:15 - 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**		

THURSDAY, 31 OCTOBER			
08:45 - 10:15	**SESSION 4A1** Droplet Microfluidics Interfaced with Mass Spectrometry	**SESSION 4B1** Wearables	**SESSION 4C1** Biofibers Dynamics and Assemblies at the Microscale
	KEYNOTE PRESENTATION **Detlev Belder**	**KEYNOTE PRESENTATION** **Stéphanie P. Lacour**	**KEYNOTE PRESENTATION** **Rikiya Watanabe**
10:15 - 10:45	**Break: Exhibit and Poster Inspection**		
10:45 - 11:45	**SESSION 4A2** Analysis of Neutrophils for Diagnosis of Sepsis and Inflammation	**SESSION 4B2** Centrifugal Platforms	**SESSION 4C2** Gas Control for Cells
11:45 - 11:50	**Transition**		
11:50 - 12:35	**PLENARY PRESENTATION VI** Aleksandra Radenovic – *École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, SWITZERLAND*		
12:35 - 13:15	**AWARDS**		
13:15	**Closing Remarks - Conference Adjourns**		

TUESDAY, 29 OCTOBER

12:40 - 14:00

Industrial Stage Presentations will be held in Singapore Room, Second Floor.

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.

INDUSTRIAL STAGE 1d **13:40 - 14:00**

INTEGRATION TECHNOLOGIES FOR NEXT-GENERATION MICROFLUIDIC DEVICES
Presenter: Bernd Dielacher

EVG Group (EVG)
www.evgroup.com

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.

Basler Münster in Basel

WEDNESDAY, 30 OCTOBER

12:25 - 13:05

Industrial Stage Presentations will be held in Singapore Room, Second Floor.

INDUSTRIAL STAGE 2a **12:25 - 12:45**

DIAGNOSTIC CONSUMABLES: WHERE IS THIS CHALLENGING MARKET HEADED?
Presenter: James Downs

SCHOTT NEXTERION®
www.schott.com/nexterion

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.

INDUSTRIAL STAGE 2b **12:45 - 13:05**

SENSORS FOR ONLINE MONITORING OF O_2, PH AND CO_2 IN MICROFLUIDICS
Presenter: Daniela Obermaier

PreSens Precision Sensing GmbH
www.presens.de

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.

Basel Town Hall

PLENARY SPEAKERS

MONDAY, 28 OCTOBER
08:30 - 09:15

Plenary Presentation I

ENGINEERED TOOLS FOR IMMUNOTHERAPIES

James R. Heath
Institute for Systems Biology
Seattle, USA

Plenary Presentation II

INTELLIGENT IMAGE-ACTIVATED CELL SORTING & BEYOND

Keisuke Goda
University of Tokyo
Tokyo, JAPAN

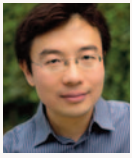
TUESDAY, 29 OCTOBER
08:30 - 09:15

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

KEYNOTE SPEAKERS

MONDAY, 28 OCTOBER
16:45 - 17:15

Session 1A3 - Single-Cell Manipulation & Analysis

CHARACTERIZATION OF OPTIMAL CULTURE CONDITIONS FOR MICROFLUIDIC 3D VASCULATURE-ON-CHIP

Angela Wu
Hong Kong University of Science and Technology
Hong Kong, HONG KONG

Session 1B3 - Organs on Chip

ADVANCED CELL MODELS, ORGANS ON CHIPS & MICROPHYSIOLOGICAL SYSTEMS AS INNOVATIVE TOOLS TO SUPPORT DRUG DEVELOPMENT

Adrian Roth
Roche Innovation Center
Basel, SWITZERLAND

Session 1C3 - Genetic Engineering

TRANSCRIPTIONAL RECORDING BY CRISPR SPACER ACQUISITION FROM RNA

Randall J. Platt
ETH Zürich
Basel, SWITZERLAND

TUESDAY, 29 OCTOBER
16:30 - 17:00

Session 2A3 - Circulating Tumor Cells & Cancer Therapy

CIRCULATING TUMOR CELLS AS LIQUID BIOPSY: FINDING RARE EVENTS FOR A HUGE KNOWLEDGE OF CANCER DISSEMINATION

Catherine Alix-Panabières
University of Montpellier
Montpellier, FRANCE

Session 2B3 - Immunoassays & Point-of-Care Devices

A POINT-OF-CARE IMMUNOASSAY PLATFORM FOR THYROID FUNCTION BASED ON HYDROGEL SENSORS EMBEDDED INSIDE A MICROFLUIDIC DEVICE

Dhananjaya Dendukuri
Achira Labs, Pvt. Ltd.
Bangalore, INDIA

Session 2C3 - Nanochannels

NANOFLUIDICS FOR ENERGY AND ENVIRONMENTAL APPLICATIONS

David Sinton
University of Toronto
Toronto, CANADA

KEYNOTE SPEAKERS

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

SPEAKER CORNER

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

10:50	Plenary Speaker III – Stefan W. Hell
	Keynote Speaker Session 1A3 – Angela Wu
	Keynote Speaker Session 1B3 – Adrian Roth
18:00	Keynote Speaker Session 2A3 – Catherine Alix-Panabières
	Keynote Speaker Session 2B3 – Dhananjaya Dendukuri
	Keynote Speaker Session 2C3 – David Sinton

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
	Keynote Speaker Session 3B3 – Cullen R. Buie
	Keynote Speaker Session 3C3 – Sumita Pennathur

THURSDAY, 31 OCTOBER

10:15	Keynote Speaker Session 4A1 – Detlev Belder
	Keynote Speaker Session 4B1 – Stéphanie P. Lacour
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:

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

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

A = San Francisco, Third Floor
B = Singapore, Second Floor
C = Sydney, Second Floor

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

1 = Concurrent Session 1 - morning
2 = Concurrent Session 2 - late-morning
3 = Concurrent Session 3 - afternoon

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.

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

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

CLASSIFICATION

a	Cells, Organisms and Organs on a Chip
b	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

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

Sponsored by CBMS Chemical and Biological Microsystems Society

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

cbmsociety.org/microtas2020

SUNDAY, 27 OCTOBER

08:30	**Workshop Registration**
09:00 - 12:00	**Morning Workshops**
Workshop 1	**DESIGN TOOLS FOR MICROFLUIDIC DEVICES** Robert Wille[1], Jan Madsen[2], and Ulf Schlichtmann[3] [1]*Johannes Kepler University, AUSTRIA,* [2]*Technical University of Denmark, DENMARK, and* [3]*Technische 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	**AC ELECTROKINETICS IN MICROSYSTEMS FOR SINGLE-CELL CYTOMETRY, MANIPULATION AND SENSING** Nathan Swami[1] and Federica Caselli[2] [1]*University of Virginia, USA and* [2]*University 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	**INCORPORATING THE NEEDS OF USERS INTO POINT-OF-CARE DIAGNOSTICS** Jaqueline Linnes *Purdue University, USA*
Workshop 7	**OPEN-SPACE MICROFLUIDICS: CONCEPTS, IMPLEMENTATIONS AND APPLICATIONS** Govind Kaigala[1], Patrick Misun[2], and Tomaso Zambelli[2] [1]*IBM Research – Zürich, SWITZERLAND and* [2]*ETH Zürich, SWITZERLAND*
Workshop 8	**LIVE CELL IMAGING IN MICROFLUIDICS** Tom Lummen[1], Oliver Biehlmaier[2], and Gregor Schmidt[1] [1]*ETH Zürich, SWITZERLAND and* [2]*University of Basel, SWITZERLAND*
Workshop 9	**3D PRINTING TOOLS** Michael Breadmore[1], Rosanne Guijt[2], Greg Nordin[3], and Egan Doeven[2] [1]*University of Tasmania, AUSTRALIA,* [2]*Deakin University, AUSTRALIA, and* [3]*Brigham Young University, USA*
Workshop 10	**ORGAN-ON-A-CHIP: MERGING MICROFABRICATION WITH TISSUE ENGINEERING** Peter Loskill[1], Olivier Guenat[2], and Olivier Frey[3] [1]*Fraunhofer Institute for Interfacial Engineering and Biotechnology IGB, GERMANY,* [2]*University of Bern, SWITZERLAND, and* [3]*InSphero AG, SWITZERLAND*
17:00 - 19:00	**Conference Registration and Check-In**
17:00 - 19:00	**Wine & Cheese Welcome Reception**

SUNDAY

IMT

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IMT develops and produces large volumes of consumables, custom-made microfluidic devices, optical components and sensors in glass and quartz.

Capabilities

- Structured metallic and dielectric coatings
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- Integration of on-chip electrodes, waveguides, optical filters and chemical (bio-)functionalization materials

Applications

- Sequencing
- Lab-on-a-Chip
- Organ-on-a-Chip
- Single Cell Detection & Analysis
- HTS
- microarrays
- Glass components for medical instruments & equipment

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MONDAY AT A GLANCE

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

MONDAY, 28 OCTOBER

07:00 **Registration**

08:00 **Opening Remarks**
CBMS President
Nicole Pamme, *University of Hull, UK*

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*

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

09:15 **Transition**

Session 1A1 - Exosomes Trapping and Isolation

Chair: Felix Kurth, *CSEM, SWITZERLAND*

San Francisco Room

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 Tay[1], Sheng Yuan Leong[1], Megha Upadya[1], Fang Kong[1], Hong Kit Lim[1], Rinkoo Dalan[2], Chor Yong Dalton Tay[1], Ming Dao[1,3], and Han Wei Hou[1]
[1]*Nanyang Technological University, SINGAPORE,*
[2]*Tan Tock Seng Hospital, SINGAPORE, and*
[3]*Massachusetts Institute of Technology, USA*

10:10 **SEPARATION OF SINGLE EXOSOMES UTILIZING A COMPOSITE NANOFLUIDIC STRUCTURE**
Haruka Ishibashi[1], Osamu Ishibashi[1], Aya Horikawa[1], Mika Hayashi[1], and Yan Xu[1,2]
[1]*Osaka Prefecture University, JAPAN and*
[2]*Japan Science and Technology Agency (JST), JAPAN*

Session 1B1 - Particle Separation

Chair: Rune Barnkob, *Technical University of Munich, GERMANY*

Singapore Room

09:30 **MINIATURIZATION OF HYDROCYCLONES: THEORETICAL AND EXPERIMENTAL EXPLORATION**
Jung Y. Han, Beqir Krasniqi, Jung Kim, Melissa Keckley, and Don L. DeVoe
University of Maryland, USA

09:50 **THE SEPARATION OF NANO-SIZED PARTICLES IN MICRO-SCALED POST ARRAYS**
Jason P. Beech[1], Kevin Keim[2], Bao Dang Ho[1], Carlotta Guiducci[2], and Jonas O. Tegenfeldt[1]
[1]*Lund University, SWEDEN and*
[2]*École Polytechnique Fédérale de Lausanne, (EPFL) SWITZERLAND*

10:10 **SIZE-BASED BIOMOLECULAR SEPARATION ENABLED BY FIELD-EFFECT ELECTROOSMOSIS**
Vesna Bacheva[1,2], Federico Paratore[1,2], Shimon Rubin[1], Govind V. Kaigala[2], and Moran Bercovici[1]
[1]*Technion - Israel Institute of Technology, ISRAEL and*
[2]*IBM Research – Zürich, SWITZERLAND*

Session 1C1 - Synthetic Biology Using Droplets

Chair: Steve Shih, *Concordia University, CANADA*

Sydney Room

09:30 **DROPLET-BASED MICROFLUIDICS FOR BOTTOM-UP SYNTHETIC BIOLOGY**
Thomas Beneyton[1], Dorothee Krafft[2], Celina Love[3], Mathias Girault[1], Claudia Bednarz[2], Christin Kleineberg[2], Christian Woelfer[2], Ivan Ivanov[2], Tanja Vidakovic-Koch[2], Kai Sundmacher[2], T.-Y. Dora Tang[3], and Jean-Christophe Baret[1]
[1]*University of Bordeaux, FRANCE and* [2]*Max Planck Institute, GERMANY*

09:50 **CREATION OF DNA MICRODROPLETS BASED ON PHASE TRANSITION AND SEQUENCE DESIGN**
Yusuke Sato, Tetsuro Sakamoto, and Masahiro Takinoue
Tokyo Institute of Technology, JAPAN

10:10 **A VERSATILE AND ROBUST DROPLET-BASED MICROFLUIDIC AUTOMATION SYSTEM FOR HIGH-THROUGHPUT OPTIMIZATION OF BIOSYNTHETIC PATHWAYS**
Kosuke Iwai[1,2], Maren Wehrs[1,3], Peter W. Kim[1,2], Jess Sustarich[1,2], Trent R. Northen[1,3,4], Hector Garcia Martin[1,3], Paul D. Adams[1,3,5], and Anup K. Singh[1,2]
[1]*Joint BioEnergy Institute, USA,* [2]*Sandia National Laboratories, USA,* [3]*Lawrence Berkeley National Laboratory, USA,* [4]*DOE Joint Genome Institute, USA, and* [5]*Univeristy of California, Berkeley, USA*

10:30 **Speaker Corner** (see page 7)

10:30 **Break: Exhibit and Poster Inspection**

Session 1A2 - Single Cell Analysis (Secretion)

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

San Francisco Room

11:00 **PRESCIENT: A PLATFORM FOR THE RAPID EVALUATION OF SINGLE CELL PRODUCED ANTIBODY SUCCESS USING INTEGRATED MICROFLUIDIC-ENABLED TECHNOLOGY**
Jose A. Wippold[1], Han Wang[1,2], Joseph Tingling[2], Julian Leibowitz[2], Paul Defigueiredo[2], and Arum Han[1]
[1]*Texas A&M University, USA and* [2]*Tsinghua University, CHINA*

11:20 **METABOLIC CHARACTERIZATION OF INDIVIDUAL IGG-SECRETING CELLS**
Mira ElKhoury[1], Guilhem Chenon[1], Andrew D. Griffiths[1], Jean Baudry[1], and Klaus Eyer[1,2]
[1]*École Supérieure de Physique et de Chimie Industrielles (ESPCI), FRANCE and* [2]*ETH Zürich, SWITZERLAND*

11:40 **SYNCHRONIZED DROP-SCREENING/SORTING FOR SINGLE CELL SECRETION MEASUREMENTS**
Guoyun Sun, Ming Wang, and Chia-Hung Chen
National University of Singapore, SINGAPORE

12:00 **DEMOCRATIZED HIGH-THROUGHPUT SINGLE-CELL SECRETION SCREENING USING DROPLETS FORMED BY STRUCTURED MICROPARTICLES**
Joseph de Rutte, Robert Dimatteo, Mark van Zee, Robert Damoiseaux, and Dino Di Carlo
University of California, Los Angeles, USA

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 Taylor[1,2] and Govind Kaigala[2]
[1]*École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND and* [2]*IBM 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

Session 1C2 - Separation and Assays in Droplets
Chair: Fan-Gang Tseng, *National Tsing Hua University, TAIWAN*

Sydney Room

11:00 **DROPLET-BASED SINGLE EXTRACELLULAR VESICLE PROTEIN PROFILING FOR THE IMPROVEMENT OF IMMUNOTHERAPY**
Jina Ko[1], Yongcheng Wang[2], Angela Marquad[1], Jonathan Carison[1], David Weitz[2], and Ralph Weissleder[1]
[1]*Massachusetts General Hospital, USA and* [2]*Harvard University, USA*

11:20 **DROPLET-BASED INVESTIGATION OF A BIOCHEMICAL BISTABLE CIRCUIT FOR SENSITIVE AND NOISE-FREE DETECTION OF NUCLEIC ACIDS**
Robin Deteix[1], Nicolas Lobato-Dauzier[1], Elia Henry[2], Shu Okumura[1], Guillaume Gines[3], Yannick Rondelez[3], Teruo Fujii[1], and Anthony J. Genot[4]
[1]*University of Tokyo, JAPAN,* [2]*François Jacob Institute of Biology-INSERM/CEA, FRANCE,* [3]*PSL Research University, FRANCE, and* [4]*LIMMS-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*

PLENARY PRESENTATION II
Chair: Je-Kyun Park, *Korea Advanced Institute of Science and Technology (KAIST), KOREA*

San Francisco Room

13:15 **INTELLIGENT IMAGE-ACTIVATED CELL SORTING & BEYOND**
Keisuke Goda[1,2,3]
[1]*University of Tokyo, Tokyo, JAPAN,* [2]*Wuhan University, CHINA, and* [3]*University of California, Los Angeles, USA*

14:00 **Speaker Corner** (see page 7)

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**

Session 1A3 - Single-Cell Manipulation and Analysis
Chair: Séverine Le Gac, *University of Twente, THE NETHERLANDS*

San Francisco Room

16:30 Keynote Presentation
CHARACTERIZATION OF OPTIMAL CULTURE CONDITIONS FOR MICROFLUIDIC 3D VASCULATURE-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[1], Solib Kang[1], Byungjin Lee[1], Si Hyung Jin[1], Yohei Yamuchi[2], Jaeseong Kim[1], and Chang-Soo Lee[1]
[1]*Chungnam National University, KOREA and* [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[1], Yuanyuan Yang[2], Zhi Zhu[2], and Chaoyong Yang[1,2]
[1]*Shanghai Jiao Tong University School of Medicine, CHINA and* [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 CROSSTALK 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. Galván[1], David Barata[1], Athanasia Zampouka[1], Jiaping Li[1], Bernhard Hesse[2], Marc Bohner[3], and Pamela Habibovic[1]
[1]*Maastricht University, THE NETHERLANDS,* [2]*European Synchrotron Radiation Facility, FRANCE, and* [3]*RMS Foundation, SWITZERLAND*

17:40 **INTEGRATION OF *EX-VIVO* PRECISION-CUT LIVER SLICE (PCLS) CULTURE WITH MICROFLUIDIC NMR METABOLOMICS**
Bishnubrata Patra[1], Manvendra Sharma[1], Ruby Karsten[2], Maciej Grajewski[2], Sabeth Verpoorte[2], and Marcel Utz[1]
[1]*University of Southampton, UK and*
[2]*University 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. Nagarajan[1], Augusto M. Tentori[1], Wen Cai Zhang[2], Frank J. Slack[2], and Patrick S. Doyle[1]
[1]*Massachusetts Institute of Technology, USA and*
[2]*Beth Israel Deaconess Medical Center, USA*

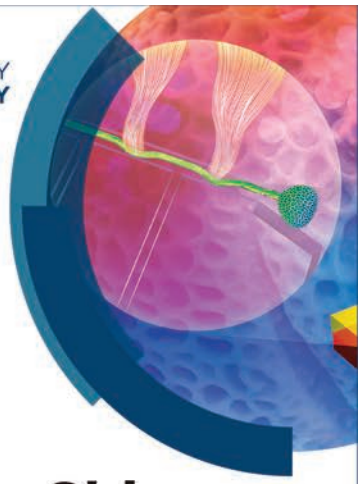
17:20 **MICRORNA DIAGNOSTICS ON AN ELECTROCHEMICAL BIOSENSOR VIA CRISPR/CAS13A TECHNOLOGY**
Richard Bruch, Julia Baaske, Claire Chatelle, Wilfried Weber, Gerald A. Urban, and Can Dincer
University of Freiburg, GERMANY

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

18:00 - 19:30	**MicroTAS Student Mixer**
18:00	**Women's Faculty Event**

MONDAY

ROYAL SOCIETY OF CHEMISTRY



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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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**

Session 2A1 - Exosomes and Extracellular Vesicles

Chair: Han Wei Hou, *Nanyang Technological University, SINGAPORE*

San Francisco Room

09:30 **IDENTIFYING EXTRACELLULAR VESICLE POPULATIONS FROM LONG-TERM CULTURED SINGLE CELLS USING MULTI-COLOR TIRFM**
Jonas Nikoloff, Lucas Armbrecht, 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 ENZYMATIC ASSAY AND REDOX CYCLING**
Dilu G. Mathew[1], Pepijn Beekman[1,2], Serge G. Lemay[1], Séverine Le Gac[1], and Wilfred G. van der Wiel[1]
[1]*University of Twente, THE NETHERLANDS and* [2]*Wageningen University, THE NETHERLANDS*

Session 2B1 - Paper Microfluidics and Devices

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

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 Fu[1,2], Xiao Li[2,3], Zhen Qin[1], and Xinyu Liu[1,2]
[1]*University of Toronto, CANADA,* [2]*McGill University, CANADA, and* [3]*Stanford 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 Komatsu[1], Manabu Tokeshi[1], and Shih-Kang Fan[2]
[1]*Hokkaido University, JAPAN and* [2]*National Taiwan University, TAIWAN*

Session 2C1 - Microfluidic Culture for Cells, Organisms and Plants
Chair: Stéphanie Descroix, *Institut Curie CNRS, FRANCE*

Sydney Room

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 Wang[1], Yung-Chin Tzeng[1], Yueh-Jen Chen[1], Li-Chen Pan[2], and Fan-Gang Tseng[1,3]
[1]*National Tsing Hua University, TAIWAN,* [2]*Taipei Medical University, TAIWAN, and* [3]*Research 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 Miyake[1], Toshihiro Kasama[1], Maia Godonoga[1], Yoshishige Endo[1], Takumi Okamoto[2], Tetsushi Koide[2], Chiharu Sone[3], Masashi Komine[3], Yukio Yaji[3], Yoshihiro Kaneta[3], and Atsushi Ogawa[3]
[1]*University of Tokyo, JAPAN,* [2]*Hiroshima University, JAPAN, and* [3]*Akita Prefectural University, JAPAN*

10:50 **Speaker Corner** (see page 7)

10:50 **Break: Exhibit and Poster Inspection**

Industrial Forum Session
Moderator: Holger Becker, *microfluidic ChipShop GmbH, GERMANY*

San Francisco Room

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**

Industrial Stage 1
Chair: Yuksel Temiz, *IBM Research – Zürich, SWITZERLAND*

Singapore Room

12:40 **1a – NEW APPLICATIONS IN PRESSURE CONTROL AND DROPLET GENERATION IN MICROFLUIDICS**
France Hamber
Fluigent, FRANCE

13:00 **1b – SE ROLE HEN VALYRĪHA KORZION ISSE MICROFLUIDICS – THE USEFULNESS OF VALYRIAN STEEL FOR MICROFLUIDICS**
Holger Becker
microfluidic ChipShop GmbH, GERMANY

13:20 **1c – THE TASTE OF PRECISION**
Melanie Büttner
CETONI GmbH, GERMANY

13:40 **1d – INTEGRATION TECHNOLOGIES FOR NEXT-GENERATION MICROFLUIDIC DEVICES**
Bernd Dielacher
EVG Group (EVG)

14:00 **Poster Session 2 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**

Session 2A3 - Circulating Tumor Cells and Cancer Therapy
Chair: Z. Hugh Fan, *University of Florida, USA*

San Francisco Room

16:30 Keynote Presentation
CIRCULATING TUMOR CELLS AS LIQUID BIOPSY: FINDING RARE EVENTS FOR A HUGE KNOWLEDGE OF CANCER DISSEMINATION
Catherine Alix-Panabieres
University Medical Center of Montpellier, FRANCE

17:00 **MICROFLUIDIC 3D CELL SIEVING FOR CLOGGING-FREE RARE CELL ENRICHMENT WITH HIGH-THROUGHPUT AND LARGE VOLUME**
Jie Cheng[1,2], Yiran Zhang[3], Yifei Ye[1,2], Xizhao Sui[4], Mingxiao Li[2], Wenjie Zhao[1,2], Xinyu Wei[2], Hongyan Guo[3], Yang Zhao[2], and Chengjun Huang[1,2]
[1]*Chinese Academy of Sciences, CHINA,* [2]*National Engineering Research Center for Beijing Biochip Technology, CHINA, and* [3]*Peking University People's Hospital, CHINA*

17:20 **MICROFLUIDIC ISOLATION OF METABOLICALLY ACTIVE CIRCULATING TUMOR CELLS AND CIRCULATING STROMAL CELLS**
Kinga Matula[1], Francesca Rivello[1], Aigars Piruska[1], Minke Smits[2], Niven Mehra[2], and Wilhelm T.S. Huck[1]
[1]*Radboud University, THE NETHERLANDS and*
[2]*Radboud Institute of Molecular Life Sciences, THE NETHERLANDS*

17:40 **AUTOMATION & INTEGRATION OF COMPUTER VISION ANALYSIS FOR IMMUNOTHERAPY RESEARCH WITH ON-CHIP CELL TRAPPING**
Chris Tostado[1], Joel Heng[2], Lucas Ong[1], Joel Voldman[3], Ramanuj DasGupta[2], and Yi-Chin Toh[1]
[1]*National University of Singapore, SINGAPORE,*
[2]*Genomic Institute of Singapore, SINGAPORE, and*
[3]*Massachusetts Institute of Technology, USA*

Session 2B3 - Immunoassays and Point-of-Care Devices
Chair: Govind Kaigala, *IBM Reserach – Zurich, SWITZERLAND*

Singapore Room

16:30 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

17:00 **MICROGEL TEMPLATED DROPLET ELISA**
Vishwesh Shah, Yilian Wang, Joseph de Rutte, Chueh-Yu Wu, and Dino Di Carlo
University of California, Los Angeles, USA

17:20 **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

17:40 **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

Session 2C3 - Nanochannels
Chair: Jan Eijkel, *Univeristy of Twente, THE NETHERLANDS*

Sydney Room

16:30 Keynote Presentation
NANOFLUIDICS FOR ENERGY AND ENVIRONMENTAL APPLICATIONS
David Sinton
University of Toronto, CANADA

17:00 **NANOFLUIDIC ENZYME REACTOR EXCEEDING LIMIT OF BULK REACTION RATE**
Koki Yamamoto[1], Kyojiro Morikawa[1], Koreyoshi Imamura[2], Hiroyuki Imanaka[2], and Takehiko Kitamori[1]
[1]*University of Tokyo, JAPAN and* [2]*Okayama University, JAPAN*

17:20 **A NANOFLUIDIC MEMRISTOR BASED ON ION CONCENTRATION POLARIZATION**
Yang Bu, Zisun Ahmed, and Levent Yobas
Hong Kong University of Science and Technology, HONG KONG

17:40 **NANOFLUIDIC FABRICATION AND MANIPULATION OF ATTOLITER DROPLETS**
Hiroto Kawagishi[1], Shuichi Kawamata[1], and Yan Xu[1,2]
[1]*Osaka Prefecture University, JAPAN and*
[2]*Japan Science and Technology Agency (JST), JAPAN*

18:00 **Speaker Corner** (see page 7)

18:00 **Adjourn for the Day**

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)		
16:00	**Exhibitor Raffle** (in Zurich Instruments Booth #7 - Ground Floor)		
16:15 - 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**

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 ANTIBIOGRAM**
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. Byrnes, 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-ATTOMOLAR PATHOGENIC DNA IN URINE USING HIERARCHICAL SELECTIVE ELECTROKINETIC PRECONCENTRATION**
Wei Ouyang and Jongyoon Han
Massachusetts Institute of Technology, USA

Session 3B1 - Devices for Detection and Imaging
Chair: Marcel Utz, *University of Southampton, UK*

Singapore Room

09:30 **ELECTRICAL DETECTION OF PATHOGENS BEYOND THE LIMITATION OF DEBYE SCREENING USING GRAPHENE FIELD-EFFECT TRANSISTORS IN MICRODROPLETS**
Takao Ono[1], Yasushi Kanai[1], Koichi Inoue[1], Yohei Watanabe[2], Shin-ichi Nakakita[3], Toshio Kawahara[4], Yasuo Suzuki[4], and Kazuhiko Matsumoto[1]
[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 Schattschneider[1], Falk Kemper[2], Erik Beckert[2], Peter Miethe[3], Andreas Willems[4], Holger Becker[1], and Claudia Gärtner[1]
[1]*microfluidic ChipShop, GERMANY,* [2]*Fraunhofer IOF, GERMANY,* [3]*fzmb 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

Session 3C1 - Surface Patterning
Chair: Qun Fang, *Zhejiang University, CHINA*

Sydney Room

09:30 **PIXELATED CHEMICAL DISPLAY: TOWARDS MASSIVELY PARALLEL DYNAMIC SURFACE PROCESSING**
Pierre-Alexandre Goyette[1], Dina Dorrigiv[1,2], Maude Tremblay[1], Kayla Simeone[2,3], and Thomas Gervais[1,2]
[1]*Polytechnique Montréal, CANADA,* [2]*Institut du Cancer de Monteréal, 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 Ostromohov[1,2], Baruch Rofman[1], Moran Bercovici[1], and Govind V. Kaigala[2]
[1]*IBM Research – Zürich, SWITZERLAND and*
[2]*Technion-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*

San Francisco Room

11:00 **DEFORMABILITY BASED CELL SORTING ENABLING QUALITY CONTROL OF STORED RED BLOOD CELLS**
Emel Islamzada[1,2], Kerryn Matthews[1], Quan Guo[1], Aline T. Santoso[1], Mark D. Scott[1,2], and Hongshen Ma[1,3]
[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 Alsved[1], Anke Urbansky[2], Pelle Ohlsson[1], Klara Petersson[1], Erling Nielsen[1], Agnes Michanek[1], and Per Augustsson[2]
[1]*AcouSort AB, SWEDEN and* [2]*Lund University, SWEDEN*

11:40 **FULLY AUTOMATED LAB-ON-A-DISC FOR LABEL-FREE ENRICHMENT OF HIGHLY PURE PLATELETS FROM WHOLE BLOOD**
Chi-Ju Kim[1,2], Dong Yeob Ki[2], Juhee Park[2], Vijaya Sunkara[2], and Yoon-Kyoung Cho[1,2]
[1]*Ulsan National Institute of Science and Technology (UNIST), KOREA and* [2]*Institute for Basic Science (IBS), KOREA*

12:00 **ARTIFICIAL MICROCIRCULATION REPLICAS USING BACKSIDE LITHOGRAPHY FOR BLOOD FLOW ANALYSIS**
Marianne Fenech[1,3], Vincent Girod[2], Viviana Claveria[3], Sebastien Meance[2], Manouk Abkarian[3], and Benoit Charlot[2]
[1]*University of Ottawa, CANADA and* [2]*University of Montpellier, FRANCE*

Session 3B2 - 3D Writing and Printing
Chair: Wouter van der Wijngaart, *KTH Royal Institute of Technology, SWEDEN*

Singapore Room

11:00 **DIRECT LASER WRITING OF THREE-DIMENSIONAL GRAPHENE-LADEN MICROSTRUCTURES INSIDE ENCLOSED MICROFLUIDIC CHANNELS**
Michael A. Restaino[1,2], Noah Eckman[1], Abdullah T. Alsharhan[1], Andrew C. Lamont[1], Asha J. Hall[2], and Ryan D. Sochol[1]
[1]*University of Maryland, USA and* [2]*Army 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 Malaquin
Université de Toulouse, FRANCE

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

12:00 **NEW 4D PRINTING USING DRY-ERASE MARKER**
Seo Woo Song[1], Sumin Lee[1], Jun Kyu Choe[2], Junwon Kang[1], Jiyun Kim[2], and Sunghoon Kwon[1]
[1]*Seoul National University, KOREA and*
[2]*Ulsan National Institute of Science and Technology (UNIST), KOREA*

Session 3C2 - Active Particles and Particle Assemblies
Chair: Chang-Soo Lee, *Chungnam National University, KOREA*

Sydney Room

11:00 **MICROFLUIDIC FABRICATION OF HIERARCHICAL PHOTONIC CRYSTAL MICROSPHERES AND THEIR APPLICATIONS**
Juan Wang[1,2], Hai Le-The[2], Lingling Shui[1], Johan G. Bomer[2], Loes I. Segerink[2], and Jan Eijkel[2]
[1]*South China Normal University, CHINA and*
[2]*University 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 Zhang[1], Erica Scott[1], Nika Shakiba[1], Peter W. Zandstra[1,2], and Aaron R. Wheeler[1]
[1]*University of Toronto, CANADA and*
[2]*University of British Columbia, CANADA*

12:20 **Grab 'n Go Lunch**

Industrial Stage 2
Chair: Bastian Rapp, *University of Freiburg, GERMANY*

Singapore Room

12:25 **2a – DIAGNOSTIC CONSUMABLES: WHERE IS THIS CHALLENGING MARKET HEADED?**
James Downs
SCHOTT NEXTERION®, GERMANY

12:45 **2b – SENSORS FOR ONLINE MONITORING OF O_2, PH AND CO_2 IN MICROFLUIDICS**
Daniela Obermaier
PreSens Precision Sensing GmbH, GERMANY

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

San Francisco Room

13:10 **ADDRESSING NEWBORN SURVIVAL GLOBALLY: THE ROLE OF INNOVATIONS IN MOVING FROM POLICY TO ACTION**
Zulfiqar A. Bhutta[1,2]
[1]*Hospital for Sick Children, Toronto, CANADA and*
[2]*Aga 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[1], Yoshikazu Kameda[1], Kensuke Yabuuchi[2], Toshikazu Araoka[3], Jun K. Yamashita[3], Tatsuji Enoki[4], Minoru Takasato[2], Kenji Osafune[3], and Ryuji Yokokawa[1]
[1]*Kyoto University, JAPAN,* [2]*RIKEN, JAPAN, and* [3]*Takara Bio Inc., JAPAN*

17:55 **BRIDGING THE GAP: A MICROFLUIDIC DEVICE FOR STUDYING ORGANOTYPIC BARRIER TISSUES**
Alec E. Richardson[1], Luke A. Schwerdtfeger[1], Diana Eaton[2], Stuart A. Tobet[1], and Charles S. Henry[1]
[1]*Colorado State University, USA and* [2]*Applied 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[1,2], Sijie Chen[1], and Cullen R. Buie[1]
[1]*Stanford University, USA and*
[2]*Massachusetts Institute of Technology, USA*

17:55 **VERSATILE ENGINEERING OF LYSINS: ONE DROP TO KILL**
Hans Gerstmans[1,2,3], Fabrice Gielen[4,5], Lorenz Van Hileghem[2], Rob Lavigne[3], Florian Hollfelder[4], Jeroen Lammertyn[2], and Yves Briers[1]
[1]*Ghent University, BELIGIUM,* [2]*KU Leuven, BELGIUM,*
[3]*University of Exeter, UK, and* [4]*University of Cambridge, UK*

Session 3C3 - Nanopores and Nanochannels
Chair: Jonas Tegenfeldt, *Lund University, SWEDEN*

Sydney Room

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**
Franziska M. Esmek and Irene Fernandez-Cuesta
Hamburg University, GERMANY

17:35 **NANOPORE 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 NANOFLUID 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**

WEDNESDAY

Conference Banquet

19:00 - 23:00

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.

THURSDAY AT A GLANCE

08:45 - 10:15	**SESSION 4A1** Droplet Microfluidics Interfaced with Mass Spectrometry	**SESSION 4B1** Wearables	**SESSION 4C1** Biofibers Dynamics and Assemblies at the Microscale
	KEYNOTE PRESENTATION Detlev Belder	**KEYNOTE PRESENTATION** Stéphanie P. Lacour	**KEYNOTE PRESENTATION** Rikiya Watanabe
10:15 - 10:45	**Break: Exhibit and Poster Inspection**		
10:45 - 11:45	**SESSION 4A2** Analysis of Neutrophils for Diagnosis of Sepsis and Inflammation	**SESSION 4B2** Centrifugal Platforms	**SESSION 4C2** Gas Control for Cells
11:45 - 11:50	**Transition**		
11:50 - 12:35	**PLENARY PRESENTATION VI** Aleksandra Radenovic – *École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, SWITZERLAND*		
12:35 - 12:45	**CHEMINAS - Young Researcher Poster Awards**		
12:45 - 12:55	**Lab on a Chip - Widmer Poster Award**		
12:55 - 13:05	**IMT Masken und Teilungen AG – Microfluidics on Glass Poster Award**		
13:05 - 13:15	**Sensors (MDPI) - Outstanding Sensors and Actuators, Detection Technologies Poster Award**		
13:15	**Closing Remarks - Conference Adjourns**		

THURSDAY, 31 OCTOBER

Session 4A1 – Droplet Microfluidics Interfaced with Mass Spectrometry
Chair: Susan Lunte, *University of Kansas, USA*

San Francisco Room

08:45 Keynote Presentation
INTERFACING DROPLET CHIPS TO MASS SPECTROMETRY
Detlev Belder
Leipzig University, GERMANY

09:15 **HIGH-THROUGHPUT X-RAY CRYSTALLOGRAPHY BASED ON THE PROTEIN CRYSTAL ARRAY**
Reo Takeda[1], Masatoshi Maeki[1,2], Sho Ito[2,3], Go Ueno[2], Kunio Hirata[2], Akihiko Ishida[1], Hirofumi Tani[1], Masaki Yamamoto[2], and Manabu Tokeshi[1]
[1]*Hokkaido University, JAPAN,* [2]*RIKEN, JAPAN, and* [3]*University of Hyogo, JAPAN*

09:35 **MASSIVE SCREENING OF METABOLITES USING PICOLITER DROPLET ARRAY WITH NANOSTRUCTURE-INITIATOR MASS SPECTROMETRY**
Noel S. Ha[1,2], Markus de Raad[1], Fangchao Song[1], Kai Deng[2,4], Nicole Ing[2,4], Anup K. Singh[2,4], and Trent R. Northen[1,2,3]
[1]*Lawrence Berkeley National Laboratory, USA,* [2]*US Department of Energy Joint BioEnergy Institute, USA,* [3]*US Department of Energy Joint Genome Institute, USA, and* [4]*Sandia National Laboratories, USA*

09:55 **MULTI-OMIC DIGITAL MICROFLUIDIC APPROACH TO CHARACTERIZATION OF THE NEURAL STEM CELL ENVIRONMENT**
Erica Y. Scott, Calvin Chan, Betty Li, Harrison Edwards, Julian Lamanna, Filip Stojic, Cindi Morshead, and Aaron Wheeler
University of Toronto, CANADA

Session 4B1 - Wearables
Chair: Carlotta Guiducci, *École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND*

Singapore Room

08:45 Keynote Presentation
SKIN-LIKE, MICROFABRICATED GALLIUM-BASED SENSORS FOR MOTION CAPTURE
Laurent Dejace, Arthur Hirsh, and Stéphanie P. Lacour
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

09:15 **ORGANIC TRANSDERMAL IONTOPHORESIS PATCH POWERED BY SERIALIZED LAYER-BUILT BIOFUEL CELLS**
Takaya Mizuno, Kaito Sato, Shinya Kusama, Shotaro Yoshida, and Matsuhiko Nishizawa
Tohoku University, JAPAN

09:35 **METAL WIRING ON FLEXIBLE ORIGAMI STRUCTURE FOR STABLE RESISTANCE VALUE AGAINST DEFORMATION**
Takuya Uchida[1], Hiroki Yasuga[2], Eiji Iwase[2], and Hiroaki Onoe[1]
[1]*Keio University, JAPAN and* [2]*Waseda University, JAPAN*

09:55 **MEDIATOR-FREE WEARABLE ENZYMATIC SENSING TO MITIGATE IONIC AND ELECTROACTIVE INTERFERENCE FOR RELIABLE OPERATION IN COMPLEX BIOFLUID**
Bo Wang, Yichao Zhao, Hannaneh Hojaiji, Minsoo Kim, and Sam Emaminejad
University of California, Los Angeles, USA

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

Sydney Room

08:45 Keynote Presentation
MICROSYSTEMS 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 Song[1,2], Jorge Correia[2], Gorge L. Ruas[2], and Ana I. Teixeira[2]
[1]*Beijing Institute of Technology, CHINA and* [2]*Karolinska Institutet, SWEDEN*

09:35 **ASSEMBLY OF ACTOMYOSIN BUNDLES IN MICROFLUIDIC CHANNEL**
Shusei Kawara[1], Yuichi Hiratsuka[2], and Hiroaki Onoe[1]
[1]*Keio University, JAPAN and*
[2]*Japan Advanced Institute Science Technology (JAIST), JAPAN*

09:55 **INVESTIGATING FIBROBLAST-INDUCED COLLAGEN GEL CONTRACTION USING A DYNAMIC MICROSCALE PLATFORM**
Tianzi Zhang[1], John H. Day[1], Xiaojing Su[1], Arturo G. Guadarrama[2], Nathan K. Sandbo[2], Stephane Esnault[2], Loren C. Denlinger[2], Erwin Berthier[1], and Ashleigh B. Theberge[1,3]
[1]*University of Washington, USA,* [2]*University of Wisconsin, USA, and*
[3]*University of Wisconsin School of Medicine and Public Health, USA*

10:15 **Speaker Corner** (see page 7)

10:15 **Break: Exhibit and Poster Inspection**

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

San Francisco Room

10:45 **RAPID MONITORING OF SEPSIS BY INTEGRATION OF SPIRAL INERTIAL MICROFLUIDICS AND ISODIELECTRIC SEPARATION**
Do-Hyun Lee[1], Hyungkook Jeon[1], Bakr Jundi[2], Rebecca M. Baron[2], Bruce D. Levy[2], Jongyoon Han[1], and Joel Voldman[1]
[1]*Massachusetts Institute of Technology, USA and*
[2]*Harvard Medical School, USA*

11:05 **EARLY SEPSIS DIAGNOSIS BY MEASURING NEUTROPHIL SPONTANEOUS MIGRATION AND RESIDUAL-PHAGOCYTOSIS USING MICROFLUIDICS**
Sinan Muldur[1], Anika Marand[1], Andreu Cullere[1], Jarone Lee[2], Michael Filbin[3], Felix Ellett[1], and Daniel Irimia[1]
[1]*Massachusetts General Hospital, USA,*
[2]*Harvard Medical School, USA, and*
[3]*Shriners Burns Hospital, USA*

11:25 **LABEL-FREE IMPEDANCE MAPPING OF NEUTROPHIL DYNAMIC IMMUNE RESPONSES FOR RAPID MULTI-PARAMETRIC INFLAMMATORY PROFILING**
Chayakorn Petchakup[1], Sheng Yuan Leong[1], Hui Min Tay[1], Rinkoo Dalan[2], King Ho Holden Li[1], and Han Wei Hou[1]
[1]*Nanyang Technological University, SINGAPORE and*
[2]*Tan Tock Seng Hospital, SINGAPORE*

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 Brassard[1], Jamal Daoud[1], Liviu Clime[1], Matthias Geissler[1], Lidija Malic[1], Denis Charlebois[2], and Teodor Veres[1]
[1]*National Research Council, CANADA and*
[2]*Canadian 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. Dignan[1], Kimberly R. Jackson[1], M. Shane Woolf[1], Christopher J. Tomley[1], and James P. Landers[1,2]
[1]*University of Virginia, USA and* [2]*MicroLab 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 Matsumoto[1], Eric Leclerc[2], Astia Riziki Safitri[1], Mathieu Danoy[3], Toshiro Maekawa[1], Haruyuki Kinoshita[1], Marie Shinohara[3], Kikuo Komori[3], Yasuyuki Sakai[3], and Teruo Fujii[1]
[1]*University of Tokyo, JAPAN and* [2]*LIMMS/CNRS-IIS, JAPAN*

11:05 **A MICROFLUIDIC OXYGENATOR WITH LARGE GAS EXCHANGE SURFACE**
Julie Lachaux[1], Gilgueng Hwang[1], Caterina Casari[2], Nassim Arouche[2], Valeria Lotito[1], Alisier Paris[1], Cécile V. Denis[2], Peter S. Lenting[2], Georges Uzan[2], Pierre Molinie[3], Olaf Mercier[3], and Anne-Marie Haghiri-Gosnet[1]
[1]*C2N CNRS, FRANCE,* [2]*Institut National de la Santé et de la Recherche Médicale (INSERM), FRANCE, and* [3]*HML, 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**

PLENARY PRESENTATION VI
Chair: Andreas Hierlemann, *ETH Zürich, SWITZERLAND*

San Francisco Room

11:50	**A TALE OF SINGLE PORE IN QUASI 2D MEMBRANES** Michael Graf, Martina Lihter, Michal Macha, Sanjin Marion, and Aleksandra Radenovic *École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, SWITZERLAND*
12:35	**CHEMINAS - Young Researcher Poster Awards**
12:45	**Lab on a Chip - Widmer Poster Award**
12:55	**IMT Masken und Teilungen AG – Microfluidics on Glass Poster Award**
13:05	**Sensors (MDPI) - Outstanding Sensors and Actuators, Detection Technologies Poster Award**
13:15	**Closing Remarks**
13:20	**Speaker Corner** (see page 7)
13:20	**Closing Remarks - Conference Adjourns**

MONDAY	TUESDAY	WEDNESDAY
14:00 - 16:30	14:00 - 16:30	14:15 - 16:45

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 Zhang[1], Ye Wang[1], Patrick R. Onck[2], and Jaap M.J. den Toonder[1]
[1] *Eindhoven University of Technology, THE NETHERLANDS and* [2] *University 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 Boul[1,2], Satomi Matsumoto[3], Marie Shinohara[3], Yasuyuki Sakai[3], Teruo Fujii[3], Anne Dubart-Kupperschmitt[2], Eric Leclerc[3], and Bruno Le Pioufle[1]
[1] *ENS Paris Saclay, FRANCE,* [2] *Université Paris-Saclay, FRANCE, and* [3] *Tokyo University, JAPAN*

T001.a **BIOSENSING AND POWER GENERATION ROBOTS USING ANHYDROBIOYIC CHIRONOMID FOR SPACE EXPRORING**
Yo Tanaka[1], Satoshi Amaya[1], Doudou Ma[1], Yigang Shen[1], Oleg Gusev[2,3], Takahiro Kikawada[4], and Yaxiaer Yalikun[1]
[1] *RIKEN, JAPAN,* [2] *NARO, JAPAN, and* [3] *Kazan Federal University, RUSSIA*

T002.a **MICROFLUIDIC FABRICATION OF BIO-ACTUATORS DRIVEN BY ARTIFICIAL MUSCLES MADE FROM MOLECULAR MOTORS**
Yingzhe Wang[1], Yuichi Hiratsuka[2], Takahiro Nitta[3], Kaoru Uesugi[1], and Keisuke Morishima[1]
[1] *Osaka University, JAPAN,* [2] *Japan Advanced Institute of Science and Technology (JAIST), JAPAN, and* [3] *Gifu University, JAPAN*

Bioinspired, Biomimetic & Biohybrid Devices

T003.a **STEREOLITHOGRAPHY (SLA) 3D PRINTED TEMPLATES FOR ENGINEERING PERFUSABLE BIOMIMETIC VASCULATURES IN ALGINATE HYDROGEL**
Terry (Tsz Him) Ching[1,2], Toh Yi-Chin[2], and Michinao Hashimoto[1]
[1] *Singapore University of Technology and Design, SINGAPORE and*
[2] *National University of Singapore, SINGAPORE*

W001.a **BASOLATERAL COMPARTMENT PRESSURE MEASUREMENT IN THE CULTURE DEVICE WITH FILTRATION FOR THE EVALUATION OF CELL LAYER CONDITION**
Kotaro Doi[1], Hiroshi Kimura[2], Masaomi Nangaku[1], and Teruo Fujii[1]
[1] *University of Tokyo, JAPAN and* [2] *Tokai University, JAPAN*

W002.a **MICROFLUIDICS-ENABLED EXTRUSION OF PROTEIN-BASED TUBULAR BIOMATERIALS AND TISSUES**
Wuyang Gao, Nima Vaezzadeh, Kelvin Chow, and Axel Guenther
University of Toronto, CANADA

a - Cells, Organisms and Organs on a Chip

Cell Capture, Counting, & Sorting

M004.a **A HANDHELD MICROFLOW CYTOMETER FOR ENUMERATION OF RESIDUAL WHITE BLOOD CELLS**
Byeongyeon Kim, Suyeon Shin, and Sungyoung Choi
Kyung Hee University, KOREA

M005.a **DIELECTROPHORETIC CANCER-TYPE SORTING CHIP AS ADVANCED LIQUID BIOPSY**
Yuto Sasaki, Mio Mizoguchi, Ken Yamamoto, and Masahiro Motosuke
Tokyo University of Science, JAPAN

M006.a **MICROFLUIDIC CHIP FOR T CELL-ANTIGEN PRESENTING CELL INTERACTION CHARACTERIZATION**
Margaux Duchamp[1], Marion Arnaud[2,3], Clarisse Vaillier[1], Sara Bobisse[2,3], George Coukos[2,3], Alexandre Harari[2], and Philippe Renaud[1]
[1] *École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND,*
[2] *Centre Hospitalier Universitaire Vaudois, SWITZERLAND, and*
[3] *Université de Lausanne, SWITZERLAND*

M007.a **PARALLEL ELECROROTATION AND SINGLE CELLS HANDLING IN INDIVIDUAL DIELECTRIC MICROCAGES**
Kevin Keim, Mohamed Z. Rashed, and Carlotta Guiducci
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

T004.a **AN OPTICAL TWEEZERS INTEGRATED MICROFLUIDIC PLATFORM FOR THE IDENTIFICATION AND RETRIEVAL OF ANTIGEN-SPECIFIC B CELLS**
Jolien Breukers, Sara Horta, Nick Geukens, Karen Vanhoorelbeke, and Jeroen Lammertyn
KU Leuven, BELGIUM

Cell Capture, Counting, & Sorting

T005.a **GROWTH PHENOTYPE BASED REPORTER-FREE SCREENING OF FILAMENTOUS FUNGI IN MICROFLUIDIC DROPLETS**
Jing Dai, Huijuan Yan, Jose Wippold, Won-Bo Shim, and Arum Han
Texas A&M University, USA

T006.a **INERTIAL MICROFLUIDICS-BASED SEPARATION OF MICROALGAE USING A CONTRACTION–EXPANSION ARRAY MICROCHANNEL**
Ga-Yeong Kim, Jaejung Son, Jong-In Han, and Je-Kyun Park
Korea Advanced Institute of Science and Technology (KAIST), KOREA

T007.a **ONE-STEP SEPARATION AND TRAPPING OF SINGLE LEUKOCYTES FROM WHOLE BLOOD IN A MICROFLUIDIC DEVICE**
Oriana G. Chavez-Pineda, Diana F. Cedillo-Alcantar, and Jose L. Garcia-Cordero
Unidad Monterrey, MEXICO

T008.a **VISCOELASTIC PARTICLE FOCUSING BASED IMAGING FLOW CYTOMETRY: AN APPLICATION TO YEAST CELLS**
Sun Ok Hong[1], Bo-Hyun Choi[1], Pyung Cheon Lee[1], Sung Sik Lee[2], and Ju Min Kim[1]
[1]*Ajou University, KOREA and* [2]*ETH Zürich, SWITZERLAND*

W003.a **A FULLY-AUTOMATED MICROFLUIDIC ROBOT FOR CIRCULATING ENDOTHELIAL PROGENITOR CELL SORTING AND ANALYSIS**
Yu Wang[1], Dong-Fei Wang[2], Hui-Feng Wang[1], Bei-Bei Sun[1], Jian-Wei Wang[1], Xiao-Gang Guo[2], and Qun Fang[1]
[1]*Zhejiang University, CHINA and* [2]*Zhejiang University School of Medicine, CHINA*

W004.a **CTC ENRICHMENT USING A 3D PRINTED DEVICE COMBINING IMMUNOAFFINITY AND FILTRATION**
Chia-Heng Chu, Ruxiu Liu, Tevhide Ozkaya-Ahmadov, and A. Fatih Sarioglu
Georgia Institute of Technology, USA

W005.a **A CIRCULATING FILTRATION SYSTEM FOR CELL RECOVERY**
Tingting Hun[1], Yaoping Liu[1], and Wei Wang[1,2]
[1]*Peking University, CHINA and* [2]*National Key Laboratory of Science and Technology on Micro/Nano Fabrication, CHINA*

W006.a **MICRO-ELECTRO-FLUIDIC-PROBE FOR SEQUENTIAL CELL SORTING AND PATTERNING**
Ayoola Brimmo, Anoop Menachery, and Mohammad A. Qasaimeh
New York University, USA

W007.a **TOWARDS CENTRIFUGATION-ASSISTED CELL TRAPPING AND ISOLATION IN A TWO-PHASE LIQUID**
Wilfred Espulgar, Yuga Okui, Masato Saito, Shohei Koyama, Atsushi Kumanogoh, Hyota Takamatsu, and Eiichi Tamiya
Osaka University, JAPAN

a - Cells, Organisms and Organs on a Chip

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

M008.a **A PERFUSABLE 3D *IN VITRO* ARTERY MODEL INCORPORATING HUMAN VASCULAR SMOOTH MUSCLE CELLS AND ENDOTHELIAL CELLS IN WRINKLED PDMS CHANNELS**
Minkyung Cho and Je-Kyun Park
Korea Advanced Institute of Science and Technology (KAIST), KOREA

M009.a **CELL BEADS TECHNOLOGY USING MICROFLUIDIC DEVICE AS A NEW PLATFORM FOR VASCULARIZED ORGANOID FORMATION**
Shogo Nagata and Shoji Takeuchi
University of Tokyo, JAPAN

M010.a **COMPOSITE PDMS-BASED *IN SITU* PATTERNING OF COLLAGEN MICROGELS FOR PERFUSION CELL CULTURE MICROSYSTEMS**
Misaki Kato, Mayu Fukushi, Masumi Yamada, Rie Utoh, and Minoru Seki
Chiba University, JAPAN

M011.a **DEVELOPMENT OF A HYDROGEL-ASSISTED MACRO-PATTERNED PLATFORM FOR MIMICKING THE NATIVE MYOCARDIUM**
Tae Hoon Shin, Da Jung Jung, and Gi Seok Jeong
Asan Medical Center, KOREA

M012.a **FABRICATION OF SPATIALLY-CONTROLLED 3D LIVER TISSUE VIA LAYERING CELL-LADEN COLLAGEN SHEETS**
Jaejung Son and Je-Kyun Park
Korea Advanced Institute of Science and Technology (KAIST), KOREA

M013.a **GENERATION OF HIGH ASPECT-RATIO PDMS MICROFIBERS FOR 3D MYELINATION CULTURE OF SCHWANN CELLS**
Hui-Ying Lin[1,2], Ing Ming Chiu[2], Horng-Dar Wang[1], and Chia-Hsien Hsu[2]
[1]*National Tsing Hua University, TAIWAN and*
[2]*National Health Research Institutes, TAIWAN*

M014.a **MODULATING THE CELL ADHESION MICROENVIRONMENT TO MECHANICALLY DRIVE TROPHECTODERM-LIKE ORGANOID FORMATION FROM HUMAN iPS CELLS**
Kennedy O. Okeyo[1], Osamu Kurosawa[2], Hidehiro Oana[3], and Masao Washizu[3]
[1]*Kyoto University, JAPAN,* [2]*RIKEN, JAPAN, and*
[3]*University of Tokyo, JAPAN*

M015.a **PARALLEL FORMATION OF CELL SPHEROIDS BASED ON VIBRATION-INDUCED FLOW**
Nanami Minoshima and Takeshi Hayakawa
Chuo University, JAPAN

M016.a **STUDY OF SYNERGISTIC EFFECT OF PHOTO-CHEMOTHERAPY ON A NEW 3D BREAST CANCER MODEL UNDER MICROFLUIDIC CONDITIONS**
Magdalena Flont, Elzbieta Jastrzebska, and Zbigniew Brzozka
Warsaw University of Technology, POLAND

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

M017.a **TUBING-FREE MICROFLUIDIC PLATFORM FOR CO-CULTURING OF 2D ADHERENT CELLS AND 3D MICROTISSUE SPHEROIDS**
Furkan Gökçe, Andreas Hierlemann, and Mario M. Modena
ETH Zürich, SWITZERLAND

T009.a **ALGINATE TUBE PROVIDES WITH FIBROBLAST GROWTH ORIENTATION BY THE SUB-MICROSTRUCTURES GENERATED DURING LIQUID ROPE-COILING PROCESS APPLIED TO CONSTRUCT TUBULAR CARDIAC TISSUE**
Bo-Heng (Henry) Liu and Fan-Gang Tseng
National Tsing Hua University, TAIWAN

T010.a **CELL ORIENTATION CONTROL BASED ON GEOMETRY SENSING IN SELF-ORGANIZED CELL SHEET FORMATION UNDER LIMITED ADHESION CONDITION**
Yoshikiyo Kibe, Kennedy O. Okeyo, and Taiji Adachi
Kyoto University, JAPAN

T011.a **CONTROLLING THE FORMATION OF OSTEOBLAST-OSTEOCYTE INTERACTIONS BY MICROPATTERNING TO STUDY BONE CELL MECHANOBIOLOGY**
Charlotte Yvanoff[1], Gintare Garbenciute[2], Vytautas Navikas[2], Ramunas Valiokas[2], and Ronnie Willaert[1]
[1] *Vrije Universiteit Brussel, BELGIUM and*
[2] *Center for Physical Sciences and Technology, LITHUANIA*

T012.a **EVALUATION OF NEURONAL ACTIVITY IN A NEURON-ASTROCYTE CO-CULTURE SYSTEM USING A MICROPOROUS SIN MEMBRANE**
Ayaka Nakama and Takashi Yasuda
Kyushu Institute of Technology, JAPAN

T013.a **FAST, INEXPENSIVE, AND BIOCOMPATIBLE FABRICATION PROTOCOL OF 3D ENDOTHELIUM-ON-CHIP USING SOFT THERMOPLASTIC ELASTOMER AND WIRE MOLDS**
Nicolas Distasio, Hugo Salmon, Mohammadreza Rasouli, and Maryam Tabrizian
McGill University, CANADA

T014.a **HANGING DROP ARRAY CHIP FOR SPHEROID CULTURE WITH FINGER-ACTUATED MICROFLUIDIC MEDIUM EXCHANGE**
Juhwan Park, Hwisoo Kim, Jieun Han, and Je-Kyun Park
Korea Advanced Institute of Science and Technology (KAIST), KOREA

T015.a **MICROFLUIDIC BIOREACTOR ARRAY FOR HIGH-THROUGHPUT SCREENING AND HATCH-LIKE EXTRACTION OF MUTANT LIBRARIES**
Janghyun Ju, Juyeol Bae, and Taesung Kim
Ulsan National Institute of Science and Technology (UNIST), KOREA

T016.a **SPATIALLY CONFINED ENDOTHELIAL CELL MONOLAYERS CONSISTENTLY ALIGN PERPENDICULAR TO FLOW**
Andrew Kuo, Craig A. Simmons, and Edmond W.K. Young
University of Toronto, CANADA

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

T017.a **STRETCHING MOTION-DRIVEN ECM-BASED PULSATILE FLOW GENERATOR FOR MIMICKING VENOUS BLOOD FLOW *IN VIVO***
Azusa Shimizu[1], Wei Huang Goh[2], Shun Itai[1], Michinao Hashimoto[2], Shigenori Miura[3], and Hiroaki Onoe[1]
[1]*Keio University, JAPAN,* [2]*Singapore University of Technology and Design, SINGAPORE, and* [3]*University of Tokyo, JAPAN*

T018.a **UNDERSTANDING CELL PROLIFERATION AND MATERIAL-INDUCED CELL DEATH ON MICROFLUIDIC DEVICES MADE OF OFF-STOICHIOMETRIC THIOL-ENES**
Kati J. Piironen, Päivi P. Järvinen, Iiro M. Kiiski, and Tiina M. Sikanen
University of Helsinki, FINLAND

W008.a **A FULLY AUTOMATED BIOREACTOR SYSTEM FOR PRECISE CONTROL OF STEM CELL PROLIFERATION AND DIFFERENTIATION**
Ki-Taek Lim
Kangwon National University, KOREA

W009.a **AN AIR-DRIVEN MICRODEVICE TO TUNE THE ANISOTROPIC CURVATURE OF CELL ADHESION PLANE TO PURSE THE MECHANOBIOLOGY OF CURVED SURFACE**
Tadahiro Yamashita, Ichiro Matsushita, and Ryo Sudo
Keio University, JAPAN

W010.a **CENTIMETER-SIZED TISSUE WITH PERFUSABLE CHANNELS TOWARD CULTURED STEAK**
Yasuaki Ishii, Yusuke Hirata, Yuya Morimoto, Ai Shima, and Shoji Takeuchi
University of Tokyo, JAPAN

W011.a **ELECTRICAL STIMULATION INDUCED MICROALGAE GROWTH AND ASTAXANTHIN PRODUCTION ON A MICROFLUIDIC CHIP**
Jaewon Park[1], Ziyi Song[1], Huixue Song[1], Junyi Yao[1], Yoon-e Choi[2], Hyunsoo Kim[3], and Yunhwan Park[2]
[1]*Southern University of Science and Technology, CHINA,* [2]*Korea University, KOREA, and* [3]*Korea Institute of Machinery and Materials, KOREA*

W012.a **FABRICATION OF CONTINUOUS MICROPORES IN CELL-ENCAPSULATING HYDROGELS USING DENSELY-PACKED MICROENGINEERED FIBERS**
Yoshimasa Minoda, Aruto Hori, Rie Utoh, Masumi Yamada, and Minoru Seki
Chiba University, JAPAN

W013.a **GENERATION AND CHARACTERIZATION OF CYCLIC OXYGEN GRADIENTS IN MICROFLUIDIC DEVICE FOR CELL CULTURE**
Dao-Ming Chang and Yi-Chung Tung
Academia Sinica, TAIWAN

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

W014.a **JELLY-FILLED DONUTS: PARALLEL HYDROGEL PLUGS WITH ISOLATION VALVES TO STUDY GROWTH EFFECTS OF TRANSIENT ANTIBIOTIC ADMINISTRATION**
Darius G. Rackus, Petra Jusková, Lucas Armbrecht, and Petra S. Dittrich
ETH Zürich, SWITZERLAND

W015.a **NEW MICROSYSTEM INTEGRATED WITH POROUS POLY (ETHYLENE TEREPHTHALATE) (PET) MEMBRANE FOR ANTICANCER DRUG ANALYSIS**
Magdalena Flont, Zuzanna Mackiewicz, Elzbieta Jastrzebska, and Zbigniew Brzozka
Warsaw University of Technology, POLAND

W016.a **RAPID AND SPATIALLY SEPERATED HETEREOGENOUS 3D CELLULAR PATTERNING USING ELECTROHYDRODYNAMICS**
Anoop Menachery[1], Abishek Vembadi[1], Pavithra Sukumar[1], Rachid Rezgui[1], and Mohammad A. Qasaimeh[1,2]
[1]*New York University, Abu Dhabi, UAE and* [2]*New York University, USA*

W017.a **SURFACE MODIFICATION OF PDMS MICROFLUIDIC DEVICES FOR STABLE ENDOTHELIAL GROWTH UNDER HIGH SHEAR STRESS**
Asma Siddique and Robert W. Stark
Technical University Darmstadt, GERMANY

a - Cells, Organisms and Organs on a Chip

Inter-& Intracellular Signaling, Cell Migration

M018.a **A SINGLE MOLECULE BARCODE NANOBIOSENSOR FOR DYNAMIC MULTIGENE ANALYSIS IN LIVE CELLS DURING TISSUE MORPHOGENESIS AND WOUND HEALING**
Yi Lu and Pak Kin Wong
Pennsylvania State University, USA

M019.a ***IN VITRO*-IN SILICO INTERFACE PLATFORM: BRIDGING THE GAP BETWEEN EXPERIMENT AND THEORY BY INFORMATION SYSTEM TO ELUCIDATE CELLULAR BEHAVIOR SYSTEM**
Asuka Yamaguchi[1], Masakazu Akiyama[2], Ikuhiko Nakase[1], and Masaya Hagiwara[1,3]
[1]*Osaka Prefecture University, JAPAN,* [2]*Meiji University, JAPAN, and* [3]*RIKEN, JAPAN*

M020.a **MICROFLUIDIC MONITORING OF CELL RESPONSE IN COMPRESSIVE MECHANICAL STRESS**
Ranjan Mishra, Nevena Srejic, Frank van Drogen, Reinhard Dechant, Sung Sik Lee, and Matthias Peter
ETH Zürich, SWITZERLAND

T019.a **DETERMINING MECHANICAL STIMULATION RESPONSES OF PRIMARY CILIA WITH AN INTEGRATED MICROFLUIDICS PLATFORM**
Sheng-Han Chu and Nien-Tsu Huang
National Taiwan University, TAIWAN

Inter-& Intracellular Signaling, Cell Migration

T020.a **INVESTIGATING THE INTERCELLULAR INTERACTION BETWEEN 3D GUT EPITHELIAL MICROTISSUES AND CIRCULATING MAIT CELLS USING A MICROFLUIDIC TILTING PLATFORM**

Oanh T.P. Nguyen[1], Patrick M. Misun[1], Christian Lohasz[1], Ramona Nudischer[2], Olivier Frey[3], Jan Devan[4], Gennaro De Libero[4], Andreas Hierlemann[1], and Kasper Renggli[1]

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T021.a **OPEN MICROFLUIDIC COCULTURE FACILITATES BIDIRECTIONAL SIGNALING BETWEEN KIDNEY EPITHELIAL AND ENDOTHELIAL CELLS**

Tianzi Zhang, Daniel Lih, Ryan J. Nagao, Jun Xue, Erwin Berthier, Jonathan Himmelfarb, Ying Zheng, and Ashleigh B. Theberge

University of Washington, USA

W018.a **A MULTIMODAL TRANSFECTION DEVICE FOR HIGH EFFICIENCY, INTRACELLULAR DELIVERY OF BIOMOLECULES**

Mohammad Aghaamoo, Neha Garg, Xuan Li, and Abraham P. Lee

University of California, Irvine, USA

W019.a **GLIOBLASTOMA MIGRATION ALONG CONSTRAINTS WITH DIFFERENT GEOMETRIES: HOW TO MIMICK BRAIN PARENCHYMA INVASION?**

Mehmet C. Tarhan[1], Alexandre Mutel[2,3], Laurence Desrues[2,3,4], Dominique Collard[5], and Hélène Castel[2,3,4]

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

W020.a **MICROFLUIDIC DEVICE FOR ELECTRICAL MEASUREMENT OF GAP JUNCTION MEDIATED INTERCELLULAR COMMUNICATION WITH INTEGRATED CALIBRATION**

Joel H. Dungan, Juanita D. Mathews, Michael Levin, and Valencia J. Koomson

Tufts University, USA

a - Cells, Organisms and Organs on a Chip

Liposomes/Membranes

M021.a **AUTOMATED OBSERVATION OF CELL-SIZED LIPOSOME WITH FEEDBACK CONTROL OF THE OUTER ENVIRONMENT**

Hironori Sugiyama[1], Toshihisa Osaki[1,2], Shoji Takeuchi[1], and Taro Toyota[1]

[1] *University of Tokyo, JAPAN and* [2] *KRISTEC, JAPAN*

M022.a **EJECTION OF LARGE PARTICULATE MATERIALS FROM GIANT UNILAMELLAR VESICLES**

Shota Katsuta, Taiji Okano, and Hiroaki Suzuki

Chuo University, JAPAN

Liposomes/Membranes

M023.a **RAPID FORMATION OF LIPID BILAYER MEMBRANES IN PARYLENE-C COATED CHIPS BY PSEUDO-PAINTING OF AN AIR BUBBLE FOR THE FUSION AND DETECTION OF OUTER MEMBRANE VESICLES (OMVS)**
Tanzir Ahmed[1], Jayesh A. Bafna[2], Sander van den Driesche[1], Martin Oellers[1], Roland Hemmler[3], Karsten Gall[3], Richard Wagner[2], Mathias Winterhalter[2], and Michael J. Vellekoop[1]
[1] *University of Bremen, GERMANY,* [2] *Jacobs University, GERMANY, and* [3] *Ionovation GmbH, GERMANY*

T022.a **DESIGNING PDMS-BASED MICROFLUIDICS FOR THE PRODUCTION OF SURFACTANT-FREE GIANT LIPID VESICLES**
Naresh Yandrapalli and Tom Robinson
Max Planck Institute, GERMANY

T023.a **MICROFLUIDIC TRAPS TO PROBE THE MECHANICS OF BIOMIMETIC VESICLES AND THEIR INTERACTION WITH NANO-OBJECTS**
Pierre Joseph[1], Costanza Montis[2], Chiara Magnani[1,2,3], Adrien Dutoya[1], Fabien Mesnilgrente[1], Barbara Lonetti[3], Debora Berti[2], and Marianne Elias[1]
[1] *LAAS-CNRS, FRANCE,* [2] *University of Florence, ITALY, and* [3] *Université de Toulouse, FRANCE*

W021.a **ASSESSMENT OF THE FACTORS INFLUENCING LIPOSOME SIZE IN DEAN-FORCES BASED μMIXERS**
Rubén R. López Salazar[1], Ixchel Ocampo[2], Karl-F. Bergeron[3], Anas Alazzam[4], Catherine Mounier[3], Ion Stiharu[5], and Vahé Nerguizian[1]
[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*

W022.a **DEVELOPMENT OF A THREE-DIMENSIONAL MICROMIXER DEVICE FOR PRODUCTION OF VARIOUS LIPID-BASED NUCLEIC ACID NANOCARRIERS**
Niko Kimura, Masatoshi Maeki, Yusuke Sato, Kosuke Sasaki, Akihiko Ishida, Hirofumi Tani, Hideyoshi Harashima, and Manabu Tokeshi
Hokkaido University, JAPAN

W023.a **LIVING IN A BUBBLE: ON CHIP MONITORING OF MICROBIAL PRODUCTION IN LIPID VESICLES**
Petra Jusková, Yannick R.F. Schmid, Steven Schmitt, Martin Held, and Petra S. Dittrich
ETH Zürich, SWITZERLAND

a - Cells, Organisms and Organs on a Chip

Multi-Organ Arrangements and Body on a Chip

M024.a **CUBE IN A CHIP: ONE TOUCH 3D TISSUE INTEGRATION AND REMOVAL SYSTEM FOR BODY ON A CHIP PLATFORM**
Masaya Hagiwara[1,2]
[1] *RIKEN, JAPAN and* [2] *Oaka Prefecture University, JAPAN*

Multi-Organ Arrangements and Body on a Chip

T024.a **A LIVER-TUMOR CO-CULTURE SYSTEM TO ASSESS METABOLISM-RELATED DRUG-DRUG INTERACTIONS**
Christian Lohasz[1], Flavio Bonanini[1], Kasper Renggli[1], Olivier Frey[2], and Andreas Hierlemann[1]
[1] *ETH Zürich, SWITZERLAND and* [2] *InSphero AG, SWITZERLAND*

T025.a **INTEGRATED GUT-LIVER ON A CHIP FOR MODELLING NON-ALCOHOLIC FATTY LIVER DISEASE *IN VITRO***
Jiandong Yang, Yoshikazu Hirai, Ken-ichiro Kamei, Toshiyuki Tsuchiya, and Osamu Tabata
Kyoto University, JAPAN

W024.a **A MULTI-MODULE MICROFLUIDIC GASTROINTESTINAL TRACT FOR TESTING FOOD AND DRUGS**
Pim de Haan[1,2], Milou J.C. Santbergen[2,3], Meike van der Zande[4], Hans Bouwmeester[3], Michel W.F. Nielen[3,4], and Elisabeth Verpoorte[1]
[1] *University of Groningen, THE NETHERLANDS,*
[2] *TI-COAST, THE NETHERLANDS,*
[3] *Wageningen University, THE NETHERLANDS, and*
[4] *Wageningen Food Safety Research, THE NETHERLANDS*

W025.a **MICROPHYSIOLOGICAL NETWORK AND COCULTURE OF FIVE MICRO ORGANS (CORTICAL AND HIPPOCAMPAL BRAIN, CARDIAC, LIVER, AND TUMOR 3D MICROTISSUES) ON 96WELL FORMAT BASED BODY ON A CHIP**
Chaewon Jin, Hongsoo Choi, and Jin-young Kim
Daegu Gyeongbuk Institute of Science and Technology (DGIST), KOREA

a - Cells, Organisms and Organs on a Chip

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

M025.a **A MICROFLUIDIC DEVICE TO ENHANCE THE THROUGHPUT OF ELECTROTAXIS SCREENING WITH CAENORHABDITIS ELEGANS MODELS OF PARKINSON'S DISEASE**
Khaled Youssef[1], Daphne Archonta[1], Terry Kubiseski[1], Anurag Tandon[2], and Pouya Rezai[1]
[1] *York University, CANADA and* [2] *University of Toronto, CANADA*

M026.a **HIGH-THROUGHPUT MECHANICAL PHENOTYPING OF *C. elegans* DIABETES MODELS USING ELASTOMERIC MICROPILLAR ARRAYS**
Samuel Sofela[1,2], Sarah Sahloul[1], Christopher Stubbs[2], Ajymurat Orozaliev[1], and Yong-Ak Song[1,2]
[1] *New York University, USA and* [2] *New York University, Abu Dhabi, UAE*

M027.a **MULTI-PHENOTYPIC MOVEMENT AND CARDIAC SCREENING OF ZEBRAFISH LARVAE USING BIDIRECTIONAL IMAGING IN A MICROFLUIDIC DEVICE**
Arezoo Khalili, Ellen Van Wijngaarden, Georg Zoidl, and Pouya Rezai
York University, CANADA

T026.a **A MICROFLUIDIC SYSTEM FOR NEMATODE IMMOBILIZATION AND BACTERIAL COLONIZATION STUDIES IN *C. elegans***
Vittorio Viri, Maël Arveiler, Thomas Lehnert, and Martin A.M. Gijs
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

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

T027.a **MICROFLUIDIC ARRAY FOR LARGE SCALE smFISH TRANSCRIPTIONAL ANALYSIS OF CAENORHABDITIS ELEGANS EMBRYOS**
Seleipiri Charles, Guillaume Aubry, Han-Ting Chou, Annalise B. Paaby, and Hang Lu
Georgia Institute of Technology, USA

T028.a **ON-DEMAND ELECTRIC FIELD INDUCED EGG LAYING OF CAENORHABDITIS ELEGANS**
Khaled Youssef[1], Daphne Archonta[1], Terry Kubiseski[1], Anurag Tandon[2], and Pouya Rezai[1]
[1] *York University, CANADA and* [2] *University of Toronto, CANADA*

W026.a **A MICROFLUIDIC-BASED PIPELINE TO INVESTIGATE *IN-SITU* GENE EXPRESSION IN WHOLE ORGANISMS WITH CELLULAR AND INTER-INDIVIDUAL RESOLUTION**
Jason Wan[1], Gongchen Sun[2], and Hang Lu[2]
[1] *Georgia Institute of Technology, USA and* [2] *Emory University, USA*

W027.a **MICROFLUIDIC-BASED ANESTHETIC-FREE MICROINJECTION OF INTACT DROSOPHILA LARVA TO INVESTIGATE THE EFFECT OF SEROTONIN ON HEARTRATE**
Alireza Zabihihesari, Arthur J. Hilliker, and Pouya Rezai
York University, CANADA

W028.a **RAPID ASSEMBLY OF CAENORHABDITIS ELEGANS ARRAY ON AN OPEN SURFACE BY CONTACT LINE COMBING FOR IMAGE-BASED SCREENING**
Gongchen Sun, Ga Hyun Lee, Guillaume Aubry, and Hang Lu
Georgia Institute of Technology, USA

a - Cells, Organisms and Organs on a Chip

Organs on Chip

M028.a **3D DYNAMIC MICROVASCULATURE-ON-CHIP: CYCLIC STRETCH AND VASCULAR REMODELING**
Soheila Zeinali[1], Merve Bulut[1], Emily K. Thompson[1], Thomas Geiser[1,2], and Olivier T. Guenat[1,2]
[1] *University of Bern, SWITZERLAND and*
[2] *University Hospital of Bern, SWITZERLAND*

M029.a **3D MICROENGINEERED VASCULARIZED TUMOR SPHEROID FOR DRUG DELIVERY AND EFFICACY TESTING**
Jungseub Lee, Jungho Ahn, and Noo Li Jeon
Seoul National University, KOREA

M030.a **A GLOMERULUS-ON-A-CHIP UTILIZING HIPSC-DERIVED PODOCYTES WITH 3D GLOMERULAR STRUCTURE**
Yang Liu[1], Ramin Banan Sadeghian[1], Yoshiki Sahara[2], Junichi Taniguchi[2], Kensuke Yabuuchi[2], Toshikazu Araoka[3], Kenji Osafune[3], Minoru Takasato[2], and Ryuji Yokokawa[1]
[1] *Kyoto University, JAPAN,* [2] *RIKEN, JAPAN, and*
[3] *Center for iPS Cell Research and Application, JAPAN*

Organs on Chip

M031.a CARTILAGE-ON-CHIP: A PHYSIOLOGICALLY INSPIRED PLATFORM TO REPRODUCE ARTICULAR JOINT COMPRESSION AND SHEAR STRAIN

Carlo Alberto Paggi, Bastien Venzac, Jeroen Leijten, Liliana Moreira-Teixeira Leijten, Marcel Karperien, and Séverine Le Gac
University of Twente, THE NETHERLANDS

M032.a EFFICIENT FABRICATION OF A PRE-INVASIVE BREAST CANCER MODEL VIA DOUBLE EMULSIFICATION OF MATRIGEL

Jelle J.F. Sleeboom[1], Cecilia M. Sahlgren[1,2], and Jaap M.J. den Toonder[1]
[1] *Eindhoven University of Technology, THE NETHERLANDS and*
[2] *Åbo Akademi University, FINLAND*

M033.a HIGH-THROUGHPUT MICROFLUIDIC PLATFORM FOR VASCULARIZATION OF 3D TISSUES: THE MISSING LINK IN TISSUE CULTURE

Arnaud Nicolas[1,2], Sara Previdi[1,3], Dorota Kurek[1], Frederik Schavemaker[1], Sebastiaan Trietsch[1], Henriette Lanz[1], and Paul Vulto[1]
[1] *Mimetas B.V., THE NETHERLANDS,* [2] *LACDR, THE NETHERLANDS and*
[3] *LUMC, THE NETHERLANDS*

M034.a MICROFLUIDIC MODEL OF THE BLOOD-RETINAL-BARRIER FOR PERMEABILITY TESTS

Jaewon Park[1], Sihan Liu[1,2], Yau Kei Chan[2], and Ho Cheung Shum[2]
[1] *Southern University of Science and Technology, CHINA and*
[2] *University of Hong Kong, CHINA*

M035.a NEW GENERATION OF AIR-BLOOD BARRIER MODEL: A LUNG-ON-CHIP WITH A STRETCHABLE BIOLOGICAL MEMBRANE

Pauline Zamprogno[1], Simon Wuethrich[1], Sven Achenbach[1], Janick D. Stucki[1], Nina Hobi[1], Nicole Schneider-Daum[2], Claus-Michael Lehr[2], Hanno Huwer[3], Ralph A. Schmid[4], and Olivier T. Guenat[1,4]
[1] *University of Bern, SWITZERLAND,* [2] *Helmholtz-Institute for Pharmaceutical Research Saarland (HIPS), GERMANY,*
[3] *Völklingen Heart Center, GERMANY, and*
[4] *University Hospital of Bern, SWITZERLAND*

M036.a RESPONSE OF TUBULAR CELLS BY EXPOSING CONTROLLED SHEAR STRESS TO PRIMARY CILIA AFTER OXIDATIVE STRESS

Masatomo Chikamori[1], Hiroshi Kimura[2], Soo Hyeon Kim[1], Masaomi Nangaku[3], and Teruo Fujii[1]
[1] *Institute of Industrial Science, JAPAN,* [2] *Tokai University, JAPAN, and*
[3] *University of Tokyo, JAPAN*

M037.a TOWARD A BLOOD-BRAIN BARRIER MICROPHYSIOLOGICAL SYSTEM WITH IN-LINE MONITORING

Ashlyn T. Young[1], Vladimir A. Pozdin[2], and Michael Daniele[1,2]
[1] *North Carolina State University, USA and*
[2] *University of North Carolina, Chapel Hill, USA*

Organs on Chip

T029.a **3D *IN VITRO* HIGH THROUGHPUT SCREENING MODEL FOR ANALYSIS OF COLORECTAL CANCER ORGANOID BY RADIOTHERAPY AND CHEMOTHERAPY FOR PRECISION MEDICINE**
Dong-Hee Choi, Yong Hun Jung, Seung-Chul Shin, Ji Hun Yang, and Seok Chung
Korea University, KOREA

T030.a **ASSESSING BARRIER PROPERTIES USING IMPEDANCE SPECTROSCOPY IN A SEMI-CIRCULAR, BLOOD-BRAIN BARRIER ON-CHIP**
Fotios Avgidis, Martijn Tibbe, Anne Leferink, and Loes Segerink
University of Twente, THE NETHERLANDS

T031.a **A CELL SHEET-BASED APPROACH FOR RECONSTITUTING *IN VITRO* BLOOD-BRAIN BARRIER MODEL PERMITING DIRECT PHYSICAL INTERACTION BETWEEN ENDOTHELIAL CELLS AND NEURAL CELLS**
Kennedy O. Okeyo, Saki Kouno, and Taiji Adachi
Kyoto University, JAPAN

T032.a **CELLS NEVER DRY: MOTILE MICROORGANISMS IN A MICROBIOSPHERE REALIZED WITH A HIGH-SPEED DROP BY DROP CONTROL**
Hironobu Maeda and Tomohiro Kawahara
Kyushu Institute of Technology, JAPAN

T033.a **ENGINEERED CORTICAL ORGANOIDS TO MODEL VALPROIC ACID EXPOSURE**
Kangli Cui, Yaqing Wang, Yujuam Zhu, Yaqong Guo, Fangchao Yin, and Jianhua Qin
Dalian Insititute of Chemistry Physics, CHINA

T034.a **LIVING SKIN-SECTION ON A CHIP**
Minghao Nie and Shoji Takeuchi
University of Tokyo, JAPAN

T035.a **MULTIPLEXED ORGAN-ON-CHIP DEVICE FOR INCREASED THROUGHPUT ANALYSIS OF THE TISSUE BARRIER FUNCTION**
Mariia Zakharova, Marinke van der Helm, Marciano Palma do Carmo, Hai Le-The, Martijn Tibbe, Andries van der Meer, Kerensa Broersen, Jan Eijkel, and Loes Segerink
University of Twente, THE NETHERLANDS

T036.a **PUMP-FREE MICROFLUIDIC SYSTEM FOR CELL CULTURE UNDER FLOW**
Mohammad Paknahad[1,2], Morvarid F. Ghahremani[1,2], Caleb Horst[3], and Craig Simmons[1,2]
[1] *Ted Rogers Centre for Heart Research, CANADA,*
[2] *University of Toronto, CANADA, and*
[3] *CellScale Biomaterials Testing, CANADA*

Organs on Chip

T037.a **THE ORGANOTEER: A SENSITIVE TEER MEASUREMENT PLATFORM FOR HIGH THROUGHPUT SCREENING OF ORGANS-ON-CHIPS**

Arnaud Nicolas[1,2], Frederik Schavemaker[1], Sebastiaan J. Trietsch[1], Henriette Lanz[1], Thomas Hankemeier[2], and Paul Vulto[1]
[1]*Mimetas B.V., THE NETHERLANDS and*
[2]*Leiden University, THE NETHERLANDS*

T038.a **TRICULTURE-BASED *IN VITRO* SYSTEM OF HUMAN BLOOD-BRAIN BARRIER WITH HIGH *IN VIVO* RELEVANCE AND ITS APPLICATION AS A DISEASE MODEL FOR DRUG SCREENING**

Suyeong Seo[1,2], Hyewhon Rhim[1,3], Kangwon Lee[2], Nakwon Choi[1,3], and Hong-Nam Kim[1,3]
[1]*Korea Institute of Science and Technology (KIST), KOREA,*
[2]*Seoul National University, KOREA, and* [3]*Korea University of Science and Technology (KUST), KOREA*

W029.a **3D LIVER TISSUE ENHANCED WITH PERFUSABLE VASCULAR CHANNEL AND SINUSOID-LIKE STRUCTURES**

Nobuhito Mori, Yuzo Takayama, and Yasuyuki S. Kida
National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

W030.a **A BIOMIMETIC BILAYER HUMAN PROXIMAL TUBULE-ON-A-CHIP TO ASSES PROXIMAL TUBULE CELLS HARVESTED FROM HPSC-DERIVED KIDNEY ORGANOIDS AS A SUBSTITUTE FOR THE IMMORTALIZED CELL COUNTERPART**

Ramin Banan Sadeghian[1], Yang Liu[1], Ryohei Ueno[1], Toshikazu Araoka[2], Jun Yamashita[2], Tatsuji Enoki[3], Minoru Takasato[4], and Ryuji Yokokawa[1]
[1]*Kyoto University, JAPAN,* [2]*Center for iPS Cell Research and Application, JAPAN,* [3]*Takara Bio, JAPAN, and* [4]*RIKEN, JAPAN*

W031.a **A MICROFLUIDIC FLOW CELL FOR MAINTENANCE AND ANALYSIS OF HUMAN SKIN SAMPLES**

Kamil Talar[1], Alexander Iles[1], Matthew Hardman[2], and Nicole Pamme[1]
[1]*University of Hull, UK and* [2]*Hull York Medical School, UK*

W032.a **EFFECTS OF BONE MARROW-DERIVED OP9 STROMAL CELLS STIMULATED IN A CELL STRETCHING DEVICE ON HEMATOPOIETIC DIFFERENTIATION**

Momoko Maeda[1], Eriko Kamata[1], Kenji Kitajima[2], Takahiko Hara[2], and Kae Sato[1]
[1]*Japan Women's University, JAPAN and*
[2]*Tokyo Metroplitan Institute of Medical Science, JAPAN*

W033.a **ENGINEERING A NOVEL MICROPHYSIOLOGICAL SYSTEM TO RECAPITULATE BIOLOGIC BARRIER FUNCTIONS**

Matthew Ishahak[1], Quratulain Amin[1], Jordan Hill[1], Adiel Hernandez[1], Laura Wubker[1], Siddarth Rawal[1], Alessia Fornoni[2], and Ashutosh Agarwal[1]
[1]*University of Miami, USA and* [2]*University of Miami Miller School of Medicine, USA*

Organs on Chip

W034.a **ENGINEERING A 3D NEURAL CIRCUIT, BLOOD-BRAIN BARRIER, AND MYELINATION ON A MICROFLUIDIC 96 WELL PLATE**
Seung-Ryeol Lee, Sujin Hyung, Seokyoung Bang, and Noo Li Jeon
Seoul National University, KOREA

W035.a **MUSCLE ON CHIP WITH A MECHANICALLY TUNABLE 3D MICROENVIRONMENT**
Chak Ming Leung, Hsih Yin Tan, Louis Jun Ye Ong, and Yi-Chin Toh
National University of Singapore, SINGAPORE

W036.a **REAL-TIME MONITORING OF OXYGEN CONSUMPTION IN PRECISION-CUT LIVER SLICES**
Maciej Grajewski, Ruby E.H. Karsten, and Elisabeth Verpoorte
University of Groningen, THE NETHERLANDS

W037.a **SEGREGATED TEER MEASUREMENT ON A DOUBLE TUBULAR RECAPITULATION OF THE BLOOD/KIDNEY BARRIER**
Todd P Burton, Kelly Klaassen, Arnaud Nicholas, Linda Gijzen, Marianne Vormann, Bob Ronden, Karel Domansky, Sebastiaan Trietsch, and Paul Vulto
Mimetas, THE NETHERLANDS

a - Cells, Organisms and Organs on a Chip

Single-Cell Analysis

M038.a **ASYMMETRICAL CONSTRICTION CHANNEL BASED MICROFLUIDIC IMPEDANCE FLOW CYTOMETRY ENABLING THE QUANTIFICATION OF SPECIFIC MEMBRANE CAPACITANCE, CYTOPLASM CONDUCTIVITY AND CELLULAR DIAMETER FROM 100,000 SINGLE CELLS**
Yi Zhang[1,2], Hongyan Liang[1,2], Deyong Chen[1,2], Junbo Wang[1,2], Ying Xu[3], and Jian Chen[1,2]
[1]*Chinese Academy of Sciences, CHINA,* [2]*University of Chinese Academy of Sciences, CHINA, and* [3]*Shanghai Jiao-Tong University School of Medicine, CHINA*

M039.a **CO-CAPTURE OF MAGNETIC BEADS AND CELLS FOR SINGLE-CELL ANALYSIS IN MICROFLUIDIC CHAMBERS**
Lucas Armbrecht, Claudius Dietsche, Rafael S. Müller, Jonas Nikoloff, and Petra S. Dittrich
ETH Zürich, SWITZERLAND

M040.a **DROPLET-ENHANCED ON-CELL ENCODING OF SINGLE CELL SECRETORY FUNCTION**
Robert Dimatteo and Dino Di Carlo
University of California, Los Angeles, USA

M041.a **HIGH-THROUGHPUT FORMATION OF CELL-MICROBEAD PAIRS FOR SINGLE CELL CYTOKINE SECRETION ANALYSIS**
Diana F. Cedillo-Alcantar, Roberto Rodriguez-Moncayo, Alberto M. Solis-Serrano, and Jose L. Garcia-Cordero
Centro de Investigación y de Estudios Avanzados del IPN, MEXICO

Single-Cell Analysis

M042.a **LINKING PHYSICAL PHENOTYPE TO DRUG RESISTANCE: SINGLE-CELL MECHANICAL MEASUREMENTS OF ACUTE PROMYELOCYTIC LEUKEMIA**
Brian L. Li, Annie M. Maslan, Aaron M. Streets, and Lydia L. Sohn
University of California, Berkeley, USA

M043.a **MICROFLUIDIC SYSTEM FOR CULTIVATION AND MONITORING OF INDIVIDUAL RIBOFLAVIN OVERPRODUCING ESCHERICHIA COLI CELLS**
Petra Juskova, Lucas Armbrecht, Steven Schmitt, Martin Held, and Petra S. Dittrich
ETH Zürich, SWITZERLAND

M044.a **ON-LINE IMPEDIMETRIC MONITORING OF SINGLE CELL ELECTRICAL LYSIS IN A MICROFLUIDIC DEVICE**
Sertan Sukas[1,2], Albert van den Berg[1], Leon Terstappen[1], and Séverine Le Gac[1]
[1]*University of Twente, THE NETHERLANDS and*
[2]*Vrije Universiteit Brussel, BELGIUM*

M045.a **SINGLE CELL FLUOROMETRIC GRANZYME B PROFILING OF IMMUNOLOGICAL CELLS AS EARLY IMMUNOTHERAPY RESPONSE PREDICTOR**
Jonathan Briones, Wilfred Espulgar, Hiroyuki Yoshikawa, Masato Saito, Shohei Koyama, Atsushi Kumanogoh, Hyouta Takamatsu, and Eiichi Tamiya
Osaka University, JAPAN

M046.a **SINGLE-CELL DETECTION OF CYTOKINES USING A SIMPLE NANOWELL CHIP INTEGRATED WITH ENCODED MICROARRAY**
Mohammed Abdullah and Jun Wang
Stony Brook University, USA

T039.a **ADHERED CELL DROP-SCREEN: ULTRAHIGH THROUGHPUT QUANTITATIVE MORPHOLOGICAL PROFILING OF ADHERED SINGLE CELLS IN RESPONSE TO MECHANICAL CUES**
Ming Wang, Hwa Liang Leo, Chwee Teck Lim, and Chia-Hung Chen
National University of Singapore, SINGAPORE

T040.a **DROPLET BASED MICROFLUIDIC FLOW CYTOMETRY CAPABLE OF QUANTIFYING COPY NUMBERS OF SPECIFIC SINGLE-CELL PROTEINS**
Yuanchen Wei, Beiyuan Fan, Lixing Liu, Hongyu Yang, Deyong Chen, Junbo Wan, and Jian Chen
Chinese Academy of Sciences, CHINA

T041.a ***IN VITRO* SINGLE-CELL VISUALLIZATION AND PROFILING OF T CELL–ANTIGEN PRESENTING CELL (APC) INTERACTION**
Hiroki Ide, Wilfred Villariza Espulgar, Masato Saito, Taiki Aoshi, and Eiichi Tamiya
Osaka University, JAPAN

Single-Cell Analysis

T042.a **MICHAELIS-MENTEN CYTOMETRY FOR THE EVALUATION OF CHRONIC MYELOGENOUS LEUKEMIA (CML) AT SINGLE-CELL RESOLUTION**
Jinzhu Yu, Botond Antal, Ki Oh, Sitapriya Moorthi, Ling Li, Chiara Luberto, Helmut Strey, Phenix-Lan Quan, and Eric Brouzes
Stony Brook University, USA

T043.a **MICROVASCULAR *IN VITRO* CONSTRICTION MODEL FOR IMAGING CANCER CELL DAMAGE AND RECOVERY**
Kyohei Terao[1], Hamizah Cognart[2], Jean-Louis Viovy[2], and Catherine Villard[2]
[1]*Kagawa University, JAPAN, and* [2]*Institut Curie, FRANCE*

T044.a **REVEALING MICRORNA NEUCLEO-CYTOPLASMIC HETEROGENEITY VIA NANO-PLASMONIC SINGLE-CELL DROPLET SCREENING**
Ri Lu[1,2], Jia Liu[1], Guoyun Sun[1], Shih-Chung Wei[2], Song Guo[1], and Chia-Hung Chen[1,2]
[1]*National University of Singapore, SINGAPORE and* [2]*iHealthtech, SINGAPORE*

T045.a **SINGLE TO COUNTABE-MOLECULE ELISA BY DEVELOPING NANOFLUIDIC DEVICE**
Ryoichi Ohta, Kazuma Mawatari, Emi Mori, and Takehiko Kitamori
University of Tokyo, JAPAN

T046.a **USING ELECTRICAL IMPEDANCE SPECTROSCOPY TO MONITOR THE DISSECTION EVENTS OF SINGLE BUDDING YEAST CELLS IN A MICROFLUIDIC DEVICE**
Yangye Geng[1], Haoxi Wang[1], Yingying Wang[1], Shuiping Ouyang[2], Zixin Wang[3], Dejing Pan[4], and Zhen Zhu[1]
[1]*Southeast University, CHINA,* [2]*Nanjing Forestry University, CHINA,* [3]*Sun Yat-Sen University, CHINA, and* [4]*Soochow University, CHINA*

W038.a **A LIQUID BIOPSY APPROACH TO EARLY DETECTION OF BONE MARROW FIBROSIS VIA SINGLE-CELL FUNCTIONAL PROTEOMICS**
Dongjoo Kim[1,2], Jonathan Chen[1], Zhuo Chen[1,2], Maria Kleppe[3], Ross L. Levine[3], and Rong Fan[1,2]
[1]*Yale University, USA,* [2]*Yale Cancer Center and Yale Stem Cell Center, USA, and* [3]*Memorial Sloan Kettering Cancer Center, USA*

W039.a **CELLULAR KINEMATIC ANALYSIS OF IMMOBILIZED SINGLE BUDDING YEAST CELLS IN CONTROLLED HYDRODYNAMIC MICROENVIRONMENT**
Yingying Wang[1], Xingyu Xu[1], Shuiping Ouyang[2], Qing-an Huang[1], and Zhen Zhu[1]
[1]*Southeast University, CHINA and* [2]*Nanjing Forestry University, CHINA*

Single-Cell Analysis

W040.a COMPARTMENTALIZED HYDROGEL MICROPARTICLE BASED DROP-SCREEN FOR MULTIMODAL SINGLE-CELL ASSAY
Myat Noe Hsu[1], Ri Lu[2], Shi-Chung Wei[3], Weikang Nicholas Lin[3], and Chia-Hung Chen[2]
[1] *Singapore-MIT Alliance for Research and Technology, SINGAPORE and* [2] *National University of Singapore, SINGAPORE*

W041.a HIGH-THROUGHPUT SINGLE-CELL IMPEDANCE CYTOMETRY OF PANCREATIC TUMOR XENOGRAFTS TO STRATIFY TUMORIGINICITY
Nathan Swami, John McGrath, Carlos Honrado, Sara Adair, and Todd Bauer
University of Virginia, USA

W042.a INDROP RAID: SINGLE CELL TRANSCRIPTOMICS COMBINED WITH INTRACELLULAR (PHOSPHO)PROTEINS QUANTIFICATION
Francesca Rivello[1], Erik van Buijtenen[1,2], Kinga Matula[2], Klaas Mulder[1], and Wilhelm T.S. Huck[1]
[1] *Radboud University, THE NETHERLANDS and* [2] *Aduro Biotech Europe, THE NETHERLANDS*

W043.a MAGNETIC RATCHETING OF HYDROGEL DROPS FOR SELECTION OF HIGH MAGNETIC BIOMASS PRODUCTION BACTERIA
Hiromi Miwa[1], Hayley McCausland[2], Coleman Murray[1], Arash Komeili[2], and Dino Di Carlo[1]
[1] *University of California, Los Angeles, USA and* [2] *University of California, Berkeley, USA*

W044.a MICROSTREAMING FLOW ARISING FROM CELLS EXCITED BY SURFACE ACOUSTIC WAVES
Alinaghi Salari[1,2], Appak-Baskoy[1,2], Michael Kolios[1,2], and Scott Tsai[1,2]
[1] *Institute for Biomedical Engineering, Science and Technology (iBEST), CANADA and* [2] *Ryerson University, CANADA*

W045.a NANO-FOCUSED ELECTRIC FIELD FOR NANO-LOCALIZED SIGLE CELL ELECTROPORATION USING ITO NANO-ELECTRODE CHIP
Tuhin S. Santra[1], Srabani Kar[1,2], and Fan-Gang Tseng[3]
[1] *Indian Institute of Technology (IITM), INDIA,* [2] *University of Cambridge, UK, and* [3] *National Tsing Hua University, TAIWAN*

W046.a SINGLE-CELL MICROFLUIDIC PLATFORM TO STUDY ANAEROBIC BACTERIA
Yanqing Song[1], Andrew Glidle[1], Christopher Quince[2], Gavin Collins[3], William Sloan[1], and Huabing Yin[1]
[1] *University of Glasgow, UK,* [2] *University of Warwick, UK, and* [3] *National University of Ireland, IRELAND*

a - Cells, Organisms and Organs on a Chip

Synthetic Biology

M047.a **A MULTIPLEXED CELL-FREE ASSAY IN DOUBLE EMULSION DROPLETS**
Nicola Nuti, Philipp Rottmann, Ariane Stucki, Sven Krähenbühl, and Petra S. Dittrich
ETH Zürich, SWITZERLAND

M048.a **SELF-ASSEMBLED MONOLAYER ON CYTOP SURFACE ALLOWS ENCAPSULATION OF DYNAMIC PROTEIN SYSTEMS IN PATTERNED CHAMBERS**
Hiromune Eto[1], Naoki Soga[2], Henri G. Franquelim[1], Alena Khmelinskaia[1,3], Lei Kai[1,4], Michael Heymann[1], Hiroyuki Noji[2], and Petra Schwille[1]
[1]*Max Planck Institute, GERMANY,* [2]*University of Tokyo, JAPAN,* [3]*University of Washington, USA, and* [4]*Jiangsu Normal University, CHINA*

T047.a **HIGH-THROUGHPUT ERROR-FREE DNA PURIFICATION THROUGH MICRO-PILLAR CHIP AND LASER RETRIEVAL SYSTEM**
Huiran Yeom, Namphil Kim, Seo Woo Song, Sumin Lee, and Sunghoon Kwon
Seoul National University, KOREA

W047.a **A MICROFLUIDIC SYSTEM TO VALIDATE A NEW KINETIC FRAMEWORK FOR WHOLE-CELL ELECTROCATALYSIS IN MICROFLOW REACTORS**
Mir Pouyan Zarabadi, Manon Couture, Steve J. Charette, and Jesse Greener
Laval University, CANADA

W048.a **QUORUM SENSING LIPOSOMES: LIPOSOME-BASED ARTIFICIAL CELLS THAT SENSE THEIR POPULATION DENSITY**
Taishi Tonooka[1], Lev Tsimring[2], and Jeff Hasty[2]
[1]*Kyoto Institute of Technology, JAPAN and*
[2]*University of California, San Diego, USA*

a - Cells, Organisms and Organs on a Chip

Vascularization

M049.a **ENHANCE CELL CONFLUENCE USING GRADUALLY-DEGRADED ALGINATE-COLLAGEN MATERIAL FOR TUNICA INTERMEDIA FORMATION**
Seok Oh[1], Van Thuy Duong[1], Huu Lam Phan[1], HyeWon Son[1], Trung Nguyen[1], Hang Phuong Nguyen[1], Thi Huong Le[1], Suwon Lee[1], HyoSeok Lee[1], Chang Ho Hwang[2], and Kyo-in Koo[1]
[1]*University of Ulsan, KOREA and* [2]*University of Ulsan College of Medicine, KOREA*

Vascularization

T048.a **"ON–CHIP VASCULAR BED" ENABLES INTEGRATION OF A SPHEROID AND PERFUSABLE VASCULATURE**
Yoshikazu Kameda[1], Ryu Okada[1], Kensuke Yabuuchi[2], Toshikazu Araoka[1], Jun K. Yamashita[1], Tatsuji Enoki[3], Minoru Takasato[2], and Ryuji Yokokawa[1]
[1] *Kyoto University, JAPAN,* [2] *RIKEN, JAPAN, and* [3] *Takara Bio Inc., JAPAN*

T049.a **OVER-FIVE-MILLIMETER DIAMETER ALGINATE-COLLAGEN ENDOTHELIALIZED TUBULAR SCAFFOLD FORMATION**
Van Thuy Duong[1], Seok Oh[1], Huu Lam Phan[1], HyeWon Son[1], Trung Nguyen[1], Hang Phuong Nguyen[1], Thi Huong Le[1], Suwon Lee[1], HyoSeok Lee[1], Chang Ho Hwang[2], and Kyo-in Koo[1]
[1] *University of Ulsan, KOREA and* [2] *University of Ulsan College of Medicine, KOREA*

W049.a **DEVELOPMENT OF A MICROFLUIDIC DEVICE CAPABLE OF GENERATING OXYGEN GRADIENTS FOR THREE-DIMENSIONAL CELL CULTURE IN HYDROGEL**
Heng-Hua Hsu[1,2], Ping-Liang Ko[1], Hsiao-Mei Wu[1], Tse Ang Lee[1], Hsi Chieh Lin[1], and Yi Chung Tung[1]
[1] *National Tsing Hua University, TAIWAN and* [2] *Academia Sinica, TAIWAN*

a - Cells, Organisms and Organs on a Chip

Other Applications in Biology

M050.a **CULTIVATION OF 'UNCULTIVABLE' MARINE SEDIMENT BACTERIA USING A MICROBIAL DOMESTICATION POD (MD Pod)**
Tartela Alkayyali, Emily Pope, Bradley Haltli, Russell G. Kerr, and Ali Ahmadi
University of Prince Edward Island, CANADA

M051.a **ON-CHIP DEFORMABILITY MEASUREMENT OF EUKARYOTIC CELLS: COMPARISON TO ANUCLEATE CELLS**
Hiroaki Ito[1], Kohei Fujimoto[2], and Makoto Kaneko[3]
[1] *Chiba University, JAPAN,* [2] *Osaka Univeristy, JAPAN, and* [3] *Meijo University, JAPAN*

T050.a **GLASS MICROFLUIDIC HIGH THROUGHPUT HYPOXIA SCREENING SYSTEM FOR OXIDATIVE STRESS ON OCULAR SURFACE CELLS**
Jeongyun Kim[2], Chiwan Koo[1], Won Choi[3], Eunjin Lee[3], Kyongjin Cho[2], Jongil Ju[2], and Jiyeon Choi[4]
[1] *Dankook University, KOREA,* [2] *Hanbat National University, KOREA,* [3] *Seoul National University, KOREA, and* [4] *Korea Institute of Machinery and Materials (KIMM), KOREA*

W050.a **A HIGH THROUGHPUT SCREENING PLATFORM TO REJUVENATE SKELETAL MUSCLE FUNCTION VIA ELECTRICAL STIMULATION**
Min Young Kim[1], Hyun Young Shin[1], Seung Joon Lee[1], and Minseok S. Kim[1,2]
[1] *Daegu Gyeongbuk Institute of Science and Technolog (DIGIST), KOREA and* [2] *Transitional Responsive Medicine Center (TRMC), KOREA*

Other Applications in Biology

W051.a MICROFLUIDIC INVESTIGATION OF RED BLOOD CELL PHASE SEPARATION IN COMPLEX MICROCHANNEL NETWORKS
Alberto Mantegazza, Francesco Clavica, and Dominik Obrist
University of Bern, SWITZERLAND

b - Chemical Applications: Separations, Mixers and Reactions

Chemical & Particle Synthesis

M052.b ESTABLISHMENT OF LABO-IN-A-MICRODROPLET FOR AZO COMPOUND SYNTHESIS
Daiki Tanaka[1], Shunsuke Sawai[1], Takuo Sugaya[1], Yoshito Nozaki[1], Dong Hyun Yoon[1], Taisuke Isano[3], Hitoshi Yamagata[3], Hiroyuki Fujita[3], Tetsushi Sekiguchi[1], Takashiro Akitsu[2], and Shuichi Shoji[1]
[1] *Waseda University, JAPAN,* [2] *Canon Medical Systems Corp., JAPAN, and* [3] *Tokyo University of Science, JAPAN*

M053.b SYNTHESIS OF AU@AG NANOPARTICLES AT A LOW-COST FDM-BASED 3D-PRINTED MICROFLUIDIC DEVICE
Lucas P. Bressan, Taíssa 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 Yamaguchi[1], Mitsuyoshi Kishihara[2], Takao Fukuoka[1], Masaya Takeuchi[1], and Yuichi Utsumi[1]
[1] *University of Hyogo, JAPAN and*
[2] *Okayama 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

b - Chemical Applications: Separations, Mixers and Reactions

Electrophoretic & Chromatographic Separation

M054.b **COUPLING ON-CHIP SEPARATIONS TO ION MOBILITY SPECTROMETRY**
Nora T. Hartner, Sebastian K. Piendl, Christian-Robert Raddatz, Christian Thoben, 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 Schaumburg[1], Pablo A. Kler[1], Claudio L.A. Berli[1], and Charles S. Henry[2]
[1] *Universidad Nacional del Litoral-CONICET, ARGENTINA and* [2] *Colorado State University, USA*

T053.b **CONTINUOUS BINARY PROTEIN SEPARATION IN A MICROFABRICATED ELECTRICAL SPLITT DEVICE**
Andrea Capuano[1,2], Andrea Adami[1], Viviana Mulloni[1], and Leandro Lorenzelli[1]
[1] *University of Trento, ITALY and* [2] *Fondazione 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 Damodara[1], Alison E. Fox-Robichaud[1,2], Dhruva J. Dwivedi[1,2], Patricia C. Liaw[1,2], and P. Ravi Selvaganapathy[1]
[1] *McMaster University, CANADA and* [2] *Thrombosis and Atherosclerosis Research Institute, CANADA*

W054.b **CONTINUOUS LITHIUM EXTRACTION FROM HIGH MG2+/LI+ RATIO BRINE BASED ON ION CONCENTRATION POLARIZATION**
Minsoo Lee[1], Hyukjin J. Kwon[2], Woochul Jung[3], and Geunbae Lim[1]
[1] *Pohang University of Science and Technology, KOREA,* [2] *Massachusetts Institute of Technology, USA, and* [3] *Research Institute of Industrial Science and Technology, KOREA*

Electrophoretic & Chromatographic Separation

W055.b MICROSCALE FORMATION OF IMMOBILIZED PH GRADIENT IN SIMPLE STRAIGHT CHANNEL
Sukyo Joung[1], Dohyun Kim[2], Jintae Kim[3], and Minsub Chung[1]
[1]*Hongik University, KOREA,* [2]*Myongji University, KOREA, and* [3]*Konkuk University, KOREA*

W056.b SMALL RNA EXTRACTION FROM CELL-LYSATE USING ISOTACHOPHORESIS
Ruba Khnouf[1], Crystal Han[2], and Sarah Munro[3]
[1]*Jordan University of Science and Technology, JORDAN,* [2]*San Jose State University, USA, and* [3]*University of Minnesota, USA*

b - Chemical Applications: Separations, Mixers and Reactions

Micromixers & Microreactors

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 Arora[1], Rossen Sedev[1,2], Craig Priest[2], Chau Chun Beh[1], and Neil Foster[1]
[1]*Curtin University, AUSTRALIA and* [2]*University 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 Zhang[1], Citsabehsan Devendran[1], Alex de Marco[1,2], and Adrian Neild[1]
[1]*Monash University, AUSTRALIA and* [2]*ARC Centre of Excellence for Advanced Molecular Imaging, AUSTRALIA*

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 Kin
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

Particle Separation

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 Solsona[1], Hans Keizer[1], Hans L. de Boer[1], Yannick P. Klein[1], Wouter Olthuis[1], Leon Abelmann[2], and Albert van den Berg[1]
[1]*University of Twente, THE NETHERLANDS, and*
[2]*Saarland 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

Particle Separation

T062.b **THE SEPARATION AND IDENTIFICATION OF PARASITE EGGS FROM HORSE FECES**
Jason P. Beech[1], Kushagr Punyani[1], Eva Tydén[2], and Jonas O. Tegenfeldt[1]
[1] *Lund University, SWEDEN and* [2] *Swedish University of Agricultural Sciences, SWEDEN*

W060.b **A 3D PRINTED MODULAR MICROFLUIDIC DEVICE FOR LARGE SCALE CELL HARVESTING FROM BIOREACTORS**
Mahsa Asadniaye Fardjahromi[1,3], Lin Ding[1], Sajad Razavi Bazaz[1], Graham Vesey[2], Mohsen Asadnia[3], and Majid Ebrahimi Warkiani[1]
[1] *University of Technology Sydney, AUSTRALIA,* [2] *Regeneus Pty Ltd, AUSTRALIA, and* [3] *Macquarie 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[1], Jumpei Yamamoto[1], Masumi Yamada[1], Kazuki Iijima[2], Koji Katayama[2], and Minoru Seki[1]
[1] *Chiba University, JAPAN and* [2] *Tosoh Corporation, JAPAN*

b - Chemical Applications: Separations, Mixers and Reactions

Other Applications in Chemistry

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[1], Benjamin Lageder[1], Bronwyn Bradshaw-Hajek[1], Barbara Breeze[2], Emma Schofield[2], Stephen Woollam[3], and Craig Priest[1]
[1] *University of South Australia, AUSTRALIA,*
[2] *Johnson Matthey Technology Centre, UK, and*
[3] *Anglo American's Technical Solutions, SOUTH AFRICA*

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

T064.b **MICROFLUIDIC METHOD FOR INVESTIGATING KINETICS OF EMULSION DESTABILIZATION**
Marcin Dudek[1], Diana Fernandes[2], Eirik H. Herø[1], and Gisle Øye[1]
[1] *Norwegian University of Science and Technology, NORWAY and*
[2] *Polytechnic Institute of Porto, PORTUGAL*

Other Applications in Chemistry

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

c - Diagnostics, Drug Testing & Personalized Medicine

Cancer Research, Capture & Analysis of Circulating Tumor Cells

M066.c A MICROFLUIDIC PLATFORM FOR DIAGNOSIS OF OVARIAN CLEAR CELL CARCINOMA VIA QUANTIFICATION OF FXYD2 GENE
Ting-Hang Liu[1], Chang-Ni Lin[2,3], Keng-Fu Hsu[2,3], and Gwo-Bin Lee[1]
[1]*National Tsing Hua University, TAIWAN,* [2]*National Cheng Kung University Hospital, TAIWAN, and* [3]*National Cheng Kung University, TAIWAN*

M067.c ARRAY OF MICRO-MAGNETS FOR CTC SORTING IN LAB-ON-A-CHIP DEVICES
Lucie Descamps[1], Samir Mekkaoui[1], Emmanuelle Laurenceau[1], Marie-Charlotte Audry[1], Jessica Garcia[2], Léa Payen[2], Damien Le Roy[3], and Anne-Laure Deman[1]
[1]*Lyon Institute of Nanotechnology, FRANCE,*
[2]*Hospices Civils de Lyon, FRANCE, and*
[3]*Institut Lumière Matière, FRANCE*

M068.c DEVELOPING AN OPTICAL DNA MAPPING TOOLBOX TO IDENTIFY CHROMOSOMAL TRANSLOCATIONS IN ACUTE MYELOID LEUKEMIA
Miriam Hitz[1,2], Gaurav Goyal[2], Vilhelm Müller[2], Linda Fogelstrand[3], and Fredrik Westerlund[2]
[1]*University of Applied Sciences, Aachen, GERMANY,*
[2]*Chalmers University of Technology, SWEDEN, and*
[3]*Sahlgrenska University Hospital, SWEDEN*

M069.c RAPID AND VIABLE ISOLATION OF HETEROGENEOUS CIRCULATING TUMOR CELLS USING HIGH-DENSITY TAPERED-SLIT FILTERS
Jae-Eul Shim[1], Jiyoon Bu[1], Mi-Kyung Lee[1], Young-Ho Cho[1], Tae-Ha Kim[2], Jong-Uk Bu[2], and Sae-Won Han[3]
[1]*Korea Advanced Institute of Science and Technology (KAIST), KOREA,*
[2]*SenPlus, Ltd., KOREA, and* [3]*Seoul National University Hospital, KOREA*

T065.c A HERRINGBONE MICROFLUIDIC PROBE FOR AFFINITY SEPARATION OF CELLS
Ayoub Glia[1,2], Pavithra Sukumar[1], Muhammedin Deliorman[1], and Mohammad Qasaimeh[1,2]
[1]*New York University, Abu Dhabi, UAE and* [2]*New 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 Huang[1], Nai-Jung Chiang[2], Cheng-Hsiu Chang[3], Priya Gopinathan[1], Terry D. Juang[1], Hsiu-Chi Tu[2], Yen-Shen Shan[2], Shang-Cheng Hung[3], and Gwo-Bin Lee[1]

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T067.c **BIOPHYSICS OF CIRCULATING TUMOR CELL CLUSTERS**

Baris R. Mutlu[1], Taronish Dubash[1], Claudius Dietsche[2], Avanish Mishra[1], Kevin Keim[3], Jon Edd[1], Daniel Haber[1], Shyamala Maheswaran[1], and Mehmet Toner[1]

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T068.c **MONITORING IMMUNOLOGICAL SYNAPSES AT SINGLE CELL LEVEL IN A MICROFLUIDIC DEVICE**

Faruk A. Shaik[1], Clara Lewuillon[1,2], Yasmine Touil[1,2], Aurélie Guillemette[1,2], Bruno Quesnel[1,2], Carine Brinster[1,2], Loïc Lemonnier[3], Dominique Collard[4], and Mehmet C. Tarhan[5]

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T069.c **SEPARATION/CAPTURE OF CANCER CELLS IN BLOOD USING A NUCLEIC-ACID APTAMER MODIFIED DYNAMIC DEFORMABLE MICROFILTER**

Yuta Nakashima[1], Soichiro Fukuyama[1], Seitaro Kumamoto[1], Keiichiro Yasuda[2], Yusuke Kitamura[1], Masaaki Iwatsuki[1], Hideo Baba[1], Toshihiro Ihara[1], and Yoshitaka Nakanishi[1]

[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 Kozminsky 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

Cancer Research, Capture & Analysis of Circulating Tumor Cells

W068.c **PICKING OF CIRCULATORY TUMOR CELLS (CTC'S) USING A MICRO FABRICATED GLASS PIPETTE INTEGRATED WITH SACA CHIP BASED DIGITIZED IMAGING SYSTEM (DIGI-SACA)**

Ping-Hao Yeh[1], Venkanagouda S. Goudar[1], Hsin-Yao Wu[1], Hsueh-Yao Chu[1], and Fan-Gang Tseng[1,2]
[1]*National Tsing Hua University, TAIWAN and*
[2]*Academica Sinica, TAIWAN*

c - Diagnostics, Drug Testing & Personalized Medicine

Clinical Chemistry

W069.c ***IN SITU* TOTAL ANALYSIS SYSTEM OF CLINICALLY ACTIONABLE GENETIC ABERRATIONS OF SINGLE CIRCULATING TUMOR CELLS ON CHIP**

Amos Chungwon Lee[1], Jessica Svedlund[2], Evangelia Darai[2], Yongju Lee[1], Ahyoun Choi[1], Sumin Lee[1], Seo Woo Song[1], Daewon Lee[1], Yeongjae Choi[1], Yunjin Jeong[1], Narayanan Madaboosi[2], Mats Nilsson[2], and Sunghoon Kwon[1]
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[2]*Science for Life Laboratory, SWEDEN*

c - Diagnostics, Drug Testing & Personalized Medicine

Diagnostic Devices

M070.c **A CMOS-BASED LAB-ON-CHIP DIAGNOSTIC SYSTEM FOR RAPID DETECTION AND WORLDWIDE MONITORING OF AZOLE-RESISTANT ASPERGILLUS FUMIGATUS**

Ling-Shan Yu, Jesus Rodriguez-Manzano, Nicolas Moser, Kenny Malpartida-Cardenas, Thomas Sewell, Matthew C. Fisher, and Pantelis Georgiou
Imperial College London, UK

M071.c **A MICRONEEDLE-BASED LATERAL FLOW IMMUNOASSAY FOR RAPID PROTEIN DETECTION**

Xue Jiang and Peter B. Lillehoj
Michigan State University, USA

M072.c **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

M073.c **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

Diagnostic Devices

M074.c DEVELOPMENT AND CLINICAL TESTING OF A MICROFLUIDIC IMMUNOAFFINITY BASOPHIL ACTIVATION TEST FOR POINT-OF-CARE ALLERGY DIAGNOSIS

Frida Kalm[1,2], Zenib Aljadi[1,2], Harisha Ramachandraiah[2], Caroline Nilsson[1,3], Ola Winqvist[4], Joachim Lundahl[1,2], Anna Nopp[1,2], and Aman Russom[2]

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M075.c FLOW VISUALIZATION IN A CORONARY NETWORK WITH MICROVASCULAR OBSTRUCTION (MVO) USING A MULTISCALE *IN-VITRO* BENCHTOP MODEL

Mirunalini Thirugnanasambandam[1], Christian Wüthrich[1], Sabrina Frey[1], Peter Heeb[2], Cornelia Nef[2], André Bernard[2], and Dominik Obrist[1]

[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. Carrrano
Paratus Diagnostics, LLC, USA

M077.c IOT PCR SYSTEM FOR DISEASE DETECTION AND SPREAD MONITORING

Hanliang Zhu[1], Pavel Podesva[1], Xiaocheng Liu[1], Haoqing Zhang[1], Tomas Teply[2], Ying Xu[1], Honglong Chang[1], Airong Qian[1], and Pavel Neuzil[1]

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[2]*Czech Technical University, CZECH REPUBLIC*

M078.c NANOFLUIDIC BARCODES FOR QUANTIFICATION/IDENTIFICATION OF BIOMARKERS

Sokhna M. Ngom[1], François-Damien Delapierre[2], Fatima Flores-Galicia[1], Stephane Guilet[1], Edmond Cambril[1], Jean Gamby[1], Antoine Pallandre[3], Isabelle Le Potier[1], and Anne-Marie Haghiri-Gosnet[1]

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M079.c OPTIMIZING ELECTROCHEMICAL IMPEDANCE SPECTROSCOPY BASED IMMUNOASSAYS ON ZINC-OXIDE-NANOWIRE PAPER-BASED ELECTRODES

Xiao Li[1,2,3], Hao Fu[1,2], Ted Li[2], and Xinyu Liu[1,2]

[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

Diagnostic Devices

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 Nestler[1], Cornelia Stiehl[1], Jenny Graunitz[1,5], Sascha Geidel[1,2], Andreas Morschhauser[2], Thomas Otto[2], Martina Schneemann[2,6], Apoorva Jnana[3], Thokur Streepathy Murali[3], Kapaettu Satyamoorthy[3], Sakthi U. Maheswari[4], Siddharth Ramakrishnan[4], Purbasha Halder[4], Dhananjaya Dendukuri[4], Frank F. Bier[5], and Harald Peter[6]
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M083.c **THIN POLYMERIC SHEET-BASED IMMUNOASSAY PLATFORMS INTEGRATED WITH MICRO/NANO-IMPRINTED MULTISCALE ARCHITECTURES**

Shuhei Aoyama[1,2], Yuto Akiyama[2], Kenji Monden[2], Masumi Yamada[1], and Minoru Seki[1]
[1]*Chiba University, JAPAN and* [2]*Denka 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 Sukas[1], Bieke Van Dorst[2], Agata Kryj[1], Ole Lagatie[2], Wim De Malsche[1], and Lieven Stuyver[2]
[1]*Vrije Universiteit Brussel, BELGIUM and* [2]*Janssen Diagnostics, BELGIUM*

T071.c **A NOVEL DIAGNOSTIC DEVICE FOR RAPID TESTING OF ANTIBIOTIC ALLERGIES: FOCUS ON FLUIDIC DESIGN AND MANUFACTURING OF DISPOSABLE DISCS**

Elizaveta Vereshchagina[1], Sergi Morais[2], Luis A. Tortajada-Genaro[2], Angel Maquieira[2], Estrella Fernandez[2], Teresa Molina[2], Veaceslav Linte[3], Brindus Comanescu[3], Michal M. Mielnik[1], Erik Andreassen[4], Anna Franquesa-Vazquez[5], Werner Balika[5], Alfredo Sáez[6], and Sergio Peransi Llopis[6]
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Diagnostic Devices

T072.c **AN INTEGRATED MICROFLUIDIC DEVICE FOR BLOOD PLASMA SEPARATION AND IMMUNOASSAY DETECTION**

Stanley C. Liu[1], Suraiya Rasheed[2], Neha Garg[3], Paul Yoo[3], Mohammad Aghaamoo[3],and Abraham Lee[3]
[1]*Arcadia High School, USA,* [2]*University of Southern California, USA, and* [3]*University 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. Jégouic[1] and Alexander D. Edwards[1,2]
[1]*University of Reading, UK and* [2]*Capillary Firm Technology Ltd, UK*

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

Keine Nishiyama[1], Toshihiro Kasama[2], Masatoshi Maeki[1], Akihiko Ishida[1], Hirofumi Tani[1], Yoshinobu Baba[3], and Manabu Tokeshi[1]
[1]*Hokkaido University, JAPAN,* [2]*University of Tokyo, JAPAN, and* [3]*Nagoya University, JAPAN*

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 Tsougeni[1], Georgia Kaprou[1,2], Christos-Mortiz Loukas[1], George Papadakis[3], Audrey Hamiot[4], Michael Eck[5], David Rabus[6], George Kokkoris[1], Vasileios Papadopoulos[1], Bruno Dupuy[4], Gerhard Jobust[5], Electra Gizeli[2,3], Angeliki Tserepi[1,2], and Evangelos Gogolides[1,2]
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T078.c **NANOPLASMO-FLUIDIC PCR CHIP WITH MICROLITER VOLUME FOR RAPID DIAGNOSTICS**

Byoung-Hoon Kang[1], Youngseop Lee[2], and Ki-Hun Jeong[1]
[1]*Korea Advanced Institute of Science and Technology (KAIST), KOREA and* [2]*University of California, Berkeley, USA*

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

T0801.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 Isebe[1], Amin Amirouche[2], Jean L. Papilleau[1], Philippe Piedcoq[1], Manuel Alessio[2],Nicolas Verplanck[2], Pierre Blandin[2], Anaïs Ali-Cherif[1], and Yves Fouillet[2]
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T082.c **SINGLE-STEP BIOLUMINESCENCE LATERAL FLOW IMMUNOASSAYS FOR DIAGNOSTICS**
Riho Shimazu[1], Junnosuke Kawahara[1], Kosuke Tomimuro[1], Kazushi Misawa[1], Yan Ni[2], Yuki Hiruta[1], Maarten Merkx[2], and Daniel Citterio[1]
[1]*Keio University, JAPAN and* [2]*Eindhoven University of Technology, THE NETHERLANDS*

T083.c **TOWARDS INTEGRATED, AUTONOMOUS AND LOW-COST DIAGNOSTICS AT THE POINT-OF-CARE FROM WHOLE BLOOD TO ANSWER**
Amin Kazemzadeh, Ruben R.G Soares, Noa Lapins, and Aman Russom
KTH Royal Institute of Technology, SWEDEN

W070.c **A LARGE-VOLUME SPUTUM COLLECTION AND DRY-STORAGE DEVICE FOR TUBERCULOSIS MOLECULAR DIAGNOSTIC TESTING**
Bhushan J. Toley, Andrea Dsouza, and Saylee Jangam
Indian Institute of Science, INDIA

W071.c **A PORTABLE AND FULLY AUTOMATED SYSTEM FOR RAPID DETECTION OF PROTEIN BIOMARKERS IN PERIPHERAL BLOOD**
Minjie Shen[1], Nan Li[1], and Youchun Xu[1,2]
[1]*Tsinghua University, CHINA and* [2]*National Engineering Research Center for Beijing Biochip Technology, CHINA*

W072.c **AUTOMATED PORTABLE DEVICE FOR ANTIMICROBIAL SUSCEPTIBILITY TEST OF ANTIBIOTICS COMBINATION**
Kuo-Wei Hsu[1], Wen-Bin Lee[1], Huey-Ling You[2], Mel S. Lee[2], and Gwo-Bin Lee[1]
[1]*National Tsing Hua University, TAIWAN and*
[2]*Kaohsiung Chang Gung Memorial Hospital, TAIWAN*

Diagnostic Devices

W073.c DESIGNING, MANUFACTURING, AND VERIFICATION OF RAPID DIAGNOSIS KIT CARTRIDGES FOR UNDILUTED WHOLE BLOOD APPLICATIONS
Yo Han Choi and Kwang Hyo Chung
Electronics and Telecommunications Research Institute, KOREA

W074.c DISTANCE READOUT-BASED PAPER DEVICES FOR MULTIPLEXED URINALYSIS
Rika Sawano, Hiroyuki Shibata, Kento Maejima, Yuki Hiruta, and Daniel Citterio
Keio University, JAPAN

W075.c FULLY-AUTOMATED SENSITIVE BLOOD-TYPING CHIP
Ken Yamamoto, Ryosuke Sakurai, and Masahiro Motosuke
Tokyo University of Science, JAPAN

W076.c HYBRIDIZATION-BASED DNA ANALYSIS BY SELF-HEATING NANOWIRE MICROFLUIDIC DEVICES
Hiromi Takahashi[1], Takao Yasui[1,2], Keiko Shinjo[1], Quanli Liu[1], Taisuke Shimada[1], Noritada Kaji[3], Hiromu Kashida[1], and Yoshinobu Baba[1,4]
[1]*Nagoya University, JAPAN,* [2]*Japan Science and Technology Agency (JST), JAPAN* [3]*Kyushu University, JAPAN, and* [4]*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*

W077.c LAB-ON-PCB PLATFORM FOR THE SENSITIVE AND RAPID DETECTION OF URINARY TRACT INFECTIONS
Georgia Kaprou, Myrto Fillipidou, Sotiris Douskas, George Kokkoris, Panagiota Petrou, Dimitris Mastellos, Stavros Chatzandroulis, and Angeliki Tserepi
National Center for Scientific Research 'Demokritos', GREECE

W078.c RAPID SALIVA SAMPLING AND DIAGNOSTIC LAB-ON-A-CHIP FOR POINT-OF-CARE TESTING (POCT) OF UNBOUND PARA THYROID HORMONE (PTH)
Vinitha TU, Sthitodhi Ghosh, Alexander Milleman, Thinh H. Nguyen, and Chong H. Ahn
University of Cincinnati, USA

W079.c PHASE CHANGE MATERIALS AS AN ENABLER FOR MALARIA DETECTION IN LOW-RESOURCE SETTINGS
Dries Vloemans[1], Francesco Dal Dosso[1], Carlos L. Orero[1], Joanne Macdonald[2,3], and Jeroen Lammertyn[1]
[1]*KU Leuven, BELGIUM,* [2]*University of the Sunshine Coast, AUSTRALIA, and* [3]*Columbia University, USA*

W080.c PRODUCT DEVELOPMENT OF A PORTABLE MICROFLUIDIC DEVICE FOR THE DETECTION OF BACTERIAL CONTAMINATION IN ENVIRONMENTAL LIQUID SAMPLES
Luis F. Alonzo[1], Andrew Miller[1], Troy Hinkley[1], Anne-Laure M. Le Ny[1], Sam R. Nugen[2], and Kevin P. Nichols[1]
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Diagnostic Devices

W081.c **SEGMENTED MICROFLUIDICS ASSISTED BACTERIAL ISOLATION FOR SEPSIS DIAGNOSIS FROM LARGE VOLUME OF BLOOD**
Suhanya Duraiswamy[1,2], Wu Ruige[1], and Wang Zhiping[1]
[1]*SIMTech, SINGAPORE and*
[2]*Indian Institute of Technology Hyderabad, INDIA*

W082.c **SLμRP: A MODULAR SCALABLE AUTOMATED MICROFLUIDIC SYSTEM FOR DIAGNOSTIC ASSAY OPTIMIZATION AND CARTRIDGE PROTOTYPING**
Carlos F. Ng[1], David P. Kalish[1], Anne V. Cheng[1], Richie E. Kohman[1,2], Jenny M. Tam[1,2], George M. Church[1,2], Richard Novak[1], and Donald E. Ingber[1,2,3]
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W083.c **TOWARDS POINT-OF-CARE HIV DIAGNOSTICS USING DUAL-LABELLED ROLLING CIRCLE PRODUCTS FOR EFFICIENT CAPTURE AND DETECTION IN A MICROFLUIDIC DEVICE**
Ruben R.G. Soares[1], Sibel Cftci[2], João C. Varela[2], Ashokkumar Manickam[3], Ujjwal Neogi[3,4], Mats Nilsson[2], Narayanan Madaboosi[2], and Aman Russom[1]
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c - Diagnostics, Drug Testing & Personalized Medicine

Drug Development, Screening & Drug Delivery

M085.c **FABRICATION OF 3D *IN VITRO* MICRO-PHYSIOLOGICAL SYSTEM CAPABLE TO STUDY THE SYSTEMIC DELIVERY OF ONCOLYTIC VIRUS**
Sang Woo Lee[1], Kyoung Jin Lee[2], Soo Yeon Jeong[1], HeuiRan Lee[2], and Gi Seok Jeong[1]
[1]*Asan Medical Center, KOREA and*
[2]*University of Ulsan College of Medicine, KOREA*

M086.c **FIBER-SHAPED 3D TISSUE IN A 96 WELL PLATE FOR HIGH-THROUGHPUT DRUG SCREENING**
Midori Kato-Negishi[1,2], Jun Sawayama[1], and Shoji Takeuchi[1]
[1]*University of Tokyo, JAPAN and* [2]*Musashino University, JAPAN*

M087.c **TOWARDS EFFICIENT DRUG CARRIERS - FUNCTIONALIZED GRAPHENE OXIDE STUDY ON 2D-MONOLAYER AND 3D-SPHEROID BREAST CANCER MODELS**
Agnieszka Zuchowska, Artur Kasprzak, Kamil Zukowski, Marta Mazurkiewicz-Pawlicka, Artur Malolepszy, Elzbieta Jastrzebska, Magdalana Poplawska, and Zbigniew Brzozka
Warsaw University of Technology, POLAND

T084.c **DIGITAL MICROFLUIDIC DRUG SCREENING ON BIOPSIES FROM XENOGRAFT MOUSE BREAST CANCER**
Jiao Zhai, Yanwei Jia, Pui-in Ma, and Rui P. Martins
University of Macau, CHINA

Drug Development, Screening & Drug Delivery

T085.c **MICROFLUIDIC IMMOBILIZED ENZYME REACTORS FOR PREDICTION OF DRUG CLEARANCE *IN VIVO***
Iiro Kiiski[1], Sanna Artes[1], Ville Jokinen[2], Päivi Järvinen[1], and Tiina Sikanen[1]
[1] *University of Helsinki, FINLAND and* [2] *Aalto University, FINLAND*

T086.c **MICROSYSTEM FOR EVALUATION THE EFFECTIVENESS OF THERAPEUTIC PROCEDURES (CT AND ECT)**
Sandra Skorupska, Ilona Grabowska-Jadach, Artur Dybko, and Zbigniew Brzózka
Warsaw University of Technology, POLAND

T087.c **ULTRA-HIGH-THROUGHPUT SCREENING OF BACTERIAL LIBRARIES TO IDENTIFY NOVEL METABOLITES THAT INDUCE MITOCHONDRIAL BIOGENESIS AND FUNCTION**
Anna Desalvo[1], Catherine Klapholz[1], Gareth Ettridge[2], Christina Kahramanoglou[1], Kamila Bienkowska[1], Robert Lightowlers[2], Doug Turnbull[2], and Stuart Wood[1]
[1] *Nanna Therapeutics Ltd, UK and* [2] *Wellcome Centre for Mitochondrial Research, UK*

W084.c **EXTRAVASATION OF SOFT NANOPARTICLES SIMULATED ON AN EASY-TO-OBSERVE MEMBRANE-INTEGRATED MICROFLUIDIC DEVICE**
Mayu Watanabe[1], Yumi Moriya[1], Hiroaki Matsuba[2], Akihiro Kishimura[2], Yoshiki Katayama[2], and Naoki Sasaki[1]
[1] *Toyo University, JAPAN and* [2] *Kyushu University, JAPAN*

W085.c **INJECTABLE WIRELESS MICRO-DEVICE INTEGRATED WITH PHOTODEGRADABLE HYDROGEL FOR DEEP TISSUE THERAPEUTICS**
Sophie Lian[1], Yi Liu[1], Rongzhou Lin[1,2], John.S. Ho[1,2], and Chia-Hung Chen[1,2]
[1] *National University of Singapore, SINGAPORE and* [2] *Institute for Health Innovation and Technology (iHealthtech), SINGAPORE*

W086.c **SIDE-BY-SIDE 2D AND 3D CELL CULTURING MICRODEVICES FOR DRUG TOXICITY SCREENING**
Päivi Järvinen[1], Ashkan Bonabi[1], Ville Jokinen[2], and Tiina Sikanen[1]
[1] *University of Helsinki, FINLAND and* [2] *Aalto University, FINLAND*

W087.c **ULTRASOUND-TRIGGERED CONTROLLED RELEASE OF NANOPARTICLES FROM HYDROGEL MICROBEADS BY RELEASE-PROMOTING PARTICLES**
Takeshi Kubota[1], Yuta Kurashina[1,2], and Hiroaki Onoe[1]
[1] *Keio University, JAPAN and* [2] *Tokyo Institute of Technology, JAPAN*

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Liquid Biopsy and Sample Preparation

M088.c **BIOMIMETIC MEMBRANE ENABLED MULTIVALENT MICROFLUIDIC CHIP FOR HIGHLY EFFICIENT ENRICHMENT OF CIRCULATING TUMOR CELLS**
Lingling Wu[1], Xin Qu[1], Yanling Song[1], and Chaoyong Yang[1,2]
[1]*Shanghai Jiao Tong University School of Medicine, CHINA and*
[2]*Xiamen University, CHINA*

M089.c **HANDHELD DEVICE FOR CENTRIFUGATION-FREE NUCLEIC ACID EXTRACTION**
Ruige Wu, Pinhui Lee, Ke Gan, Wei Hua, and Zhiping Wang
*Singapore Institute of Manufacturing Technology (A*Star), SINGAPORE*

M090.c **INTEGRATED MICROFLUIDIC DEVICE FOR CIRCULATING EXOSOMES DETECTION TOWARDS BREAST CANCER DIAGNOSIS**
Wenwen Chen[1], Wentao Su[1], Hongjing Li[2], and Jianhua Qin[1]
[1]*Chinese Academy of Sciences, CHINA and*
[2]*First Affiliated Hospital of Dalian Medical University, CHINA*

M091.c **MICROFLUIDIC DEVICE FOR THE SEPARATION OF BLOOD PLASMA FROM CAPILLARY SAMPLES**
Giulia Deiana[1], Alvaro J. Conde[1,2], Conni McCarthy[1,2], James Dear[1], Stewart Smith[1], and Maïwenn Kersaudy-Kerhoas[1,2]
[1]*University of Edinburgh, UK and* [2]*Heriot-Watt University, UK*

T088.c **CREATING A MAP FOR SURGEONS: DIRECT BLOTTING ASSISTED STAMPING OF TISSUE FOR MALDI IMAGING MASS SPECTROMETRY USING DISCONTINUOUS DE-WETTED ARRAYS**
Katherine Donovan, Haidy Metwally, Prashant Agrawal, David Simon, David Berman, and Richard Oleschuk
Queen's University, CANADA

T089.c **HIGH-THROUGHPUT SEPARATION AND COLLECTION OF EXOSOMES BASED ON SURFACE ZETA POTENTIAL TOWARD EXOSOMAL DIAGNOSTICS AND THERAPY**
Hiroaki Takehara[1,2], Hiromi Kishita[1], Shusuke Sato[2], and Takanori Ichiki[1,2]
[1]*University of Tokyo, JAPAN and* [2]*Innovation Center of NanoMedicine (iCONM), JAPAN*

T090.c **LONG DNA ISOLATION AND IMAGING USING LATERAL DISPLACEMENT ARRAYS INTEGRATED WITH DNA COMBING**
Oskar E. Ström, Jason P. Beech, and Jonas O. Tegenfeldt
Lund University, SWEDEN

Liquid Biopsy and Sample Preparation

T091.c **NITROGEN-MUSTARD COATED MAGNETIC BEADS FOR HYBRIDIZATION AND ELUTION-FREE CIRCULATING TUMOR DNA DETECTION**
Benedikturs N. Hapsianto[1], Naoshi Kojima[2], Ryoji Kurita[2], Hitoshi Yamagata[3], Hiroyuki Fujita[3], Teruo Fujii[1], and Soo Hyeon Kim[1]
[1] *University of Tokyo, JAPAN,* [2] *National Institute of Advanced Industrial Science and Technology (AIST), JAPAN, and* [3] *Canon Medical Systems Corporation, JAPAN*

W088.c **SEARCHING CANCER-SPECIFIC EXTRACELLULAR VESICLE USING SIZE FRACTION AND SINGLE VESICLE ANALYSIS**
Dongyoung Kim[1], Hyun-Kyung Woo[1,2], Chaeeun Lee[1,2], Yoohong Min[1], and Yoon-Kyoung Cho[1,2]
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W089.c **INKJET-PRINTING BASED INTEGRATION OF MICROFLUIDICS ON FROZEN SECTION FOR SPATIALLY STAINING**
Fengyi Zheng[1], Jiasheng Huang[1], Xiaoyi Shi[1], Fei Pei[2], and Zhihong Li[1]
[1] *Peking University, CHINA and* [2] *Peking University Health Science Center, CHINA*

W090.c **MAGNETIC BEAD FREE DNA EXTRACTION ENABLED BY EWOD DIGITAL MICROFLUIDICS**
Shubhodeep Paul and Hyejin Moon
University of Texas, Arlington, USA

W091.c **POLYVINYL ALCOHOL (PVA)-FUNCTIONALIZED FILTER FOR EFFECTIVE CELL CAPTURE AND RELEASE**
Tingyu Li[1], Yaoping Liu[1], and Wei Wang[1,2]
[1] *Peking University, CHINA and* [2] *National Laboratory of Science and Technology on Micro/Nano Fabrication, CHINA*

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Neurobiology/Neuroscience

M092.c **BACK-TO-BACK CO-CULTURE OF NEURONS/ASTROCYTES ON A MICROPOROUS SIN MEMBRANE AND MULTICHANNEL MEASUREMENT OF NEURONAL POTENTIAL USING A MICROELECTRODE ARRAY**
Satoshi Yoshida and Takashi Yasuda
Kyushu Institute of Technology, JAPAN

M093.c **ON-LINE MICRODIALYSIS-MICROCHIP ELECTROPHORESIS WITH ELECTROCHEMICAL DETECTION FOR CONTINUOUS *IN VIVO* MONITORING OF CATECHOLAMINES**
Susan M. Lunte, Shamal M. Gunawardhana, Galina A. Bulgakova, and Sara R. Thomas
University of Kansas, USA

Neurobiology/Neuroscience

T092.c **CHARACTERIZATION OF NEURON SIGNALING USING MICROELECTRODE ARRAY COMBINED WITH FAST AND PRECISE COOLING DEVICE FOR CRYOANESTHESIA**
Jaehyun Kim[1], Jong Seung Lee[2], Soyeon Noh[3], Nuree Lee[1], Jungchul Lee[4], Taesung Kim[3], Gunho Kim[3], Seung-Woo Cho[2], and Jungyul Park[1]
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W092.c **ELECTROPHYSIOLOGICAL RECORDINGS OF CORTICO-STRIATAL NETWORK ACTIVITY IN MICROFLUIDIC-MEA-HYBRID SYSTEM**
Jelena Stevanović[1,2], Kathrin Zobel[1], Bernhard Wolfrum[1], and Andreas Offenhäusser[1]
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Nucleic-Acid Analysis

M094.c **A VERSATILE MICROFLUIDIC PLATFORM FOR AUTOMATING COMPLEX BIOLOGICAL AND CHEMICAL PROTOCOLS**
Mais J. Jebrail, Eugenia Carvajal, Eduardo Cervantes, Poornasree Kumar, Winnie Chow, Yu-Hung Chen, and Foteini Christodoulou
Miroculus, USA

M095.c **DIAGNOSIS OF METHYLATED DNA FRAGMENTS OF TUMOR SUPPRESSOR GENES IN BLOOD BY UTILIZING METHYLATION-SPECIFIC APTAMERS ON A MICROFLUIDIC SYSTEM**
Chih-Hung Wang and Gwo-Bin Lee
National Tsing Hua University, TAIWAN

M096.c **HAIRPIN-STRUCTURED PCR ENHANCER FOR MICROFLUIDIC PLATFORMS**
Ren Shen[1], Yanwei Jia[1], Pui-In Mak[1], and Rui P. Martins[1,2]
[1]*University of Macau, CHINA and* [2]*Universidade de Lisoba, PORTUGAL*

M097.c **MICROWELL ARRAY BASED NAZYME BIOASSAY FOR MUTANT & MULTIPLEXED TARGET DETECTION**
Saba Safdar, Karen Ven, Julie van Lent, Jeroen Lammertyn, and Dragana Spasic
KU Leuven, BELGIUM

T093.c **AN ULTRASENSITIVE, SEMI-QUANTITATIVE MEASUREMENT OF HIV NUCLEOSIDE REVERSE TRANSCRIPTASE INHIBITORS (NRTI) WITH RT-RECOMBINASE POLYMERASE AMPLIFICATION (RT-RPA) FOR RAPID PREP ADHERENCE TESTING**
Jane Y. Zhang, Ayokunle O. Olanrewaju, Andrew T. Bender, Yu Zhang, Paul K. Drain, and Jonathan D. Posner
University of Washington, USA

Nucleic-Acid Analysis

T094.c **DNA DIGESTION USING IMMOBILIZED DNASE TYPE I IN A MICROFLUIDIC CARTRIDGE**

Jenny Graunitz[1,2], Sandra Kuhn[3], Cornelia Stiehl[2], Martina Schneemann[4,5], Andreas Morschhauser[4], Harald Peter[5], Frank Bier[1], and Joerg Nestler[2]
[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*

T095.c **HIGH THROUGHPUT SAMPLE DISCRETIZATION, REAGENT INTEGRATION, AND CONTROLLED RELEASE FOR MULTIPLEXED LOOP-MEDIATED ISOTHERMAL AMPLIFICATION IN DISPOSABLE THERMOPLASTIC 2D MICROWELL ARRAYS**

Supriya Padmanabhan, Imaly Nanayakkara, Ian White, and Don L. DeVoe
University of Maryland, USA

T096.c **OPTICAL DNA MAPPING USING NANOCHANNELS FOR IDENTIFICATION OF PLASMIDS CARRYING CARBAPENEMASE BLANDM-1 GENE FROM PATIENTS ADMITTED TO A VIETNAMESE HOSPITAL**

Sriram KK[1], Maud Nilsson[2], Björn Berglund[2], Linus Olson[3], Hoang Bich Ngoc[4], Tran Minh Dien[4], Mattias Larsson[3], Håkan Hanberger[2], Christian Giske[3], and Fredrik Westerlund[1]
[1]*Chalmers University of Technology, SWEDEN,* [2]*Linköping University, SWEDEN,* [3]*Karolinska Institute, SWEDEN, and* [4]*Vietnam National Children's Hospital, VIETNAM*

W093.c **A DUAL-HEATER DIGITAL MICROFLUIDIC SYSTEM FOR FAST POLYMERASE CHAIN REACTION WITH SLOPPY TEMPERATURE CONTROL**

Liang Wan[1], Tianlan Chen[1], Haoran Li[1], Cheng Dong[1], Yanwei Jia[1], Pui-In Mak[1], and Rui P. Martins[1,2]
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W094.c **BURIED MICROFLUIDIC CHANNELS WITH OBSERVATION WINDOW FOR A HEAT TRANSFER DETERMINATION BASED ON DNA MELTING CURVE ANALYSIS**

Zdenka Fohlerova[1], Hanliang Zhu[2], Imrich Gablech[1], and Pavel Neuzil[1,2]
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W095.c **DNA OPTICAL MAPPING IN REAL TIME**

Franziska M. Esmek[1], Marlin Therre[2], Manja Czech-Sioli[2], Nicole Fischer[2], Thomas Guenther[3], Adam Grundhoff[3], and Irene Fernandez-Cuesta[1]
[1]*Universität Hamburg, GERMAN,* [2]*Instityte for Medical Microbiology, GERMANY, and* [3]*Henrich-Pette-Institut, GERMANY*

Nucleic-Acid Analysis

W096.c **INTEGRATION OF ISOTHERMAL MOLECULAR AMPLIFICATION WITH CENTRIFUGAL MICROFLUIDIC PLATFORM AND NANOPARTICLE BASED OPTOMAGNETIC READOUT FOR DETECTION OF *E. coli***

Robert W. Baber[1], Marco Donolato[2], Mikkel F. Hansen[1], and Jeppe Fock[2]
[1] *Technical University of Denmark, DENMARK and* [2] *Blusense Diagnostics ApS, DENMARK*

W097.c **POINT-OF-CARE NUCLEIC ACID SENSORS VIA PAPER-BASED OLIGONUCLEOTIDE-TEMPLATED REACTIONS**

Robert B. Channon[1], Suraj Pavagada[1], Jason Y.H. Chang[1], Sung Hye Kim[1], David MacIntyre[1,2], Phillip R. Bennett[1,2], Vasso Terzidou[1,3], Danny O'Hare[1], and Sylvain Ladame[1]
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c - Diagnostics, Drug Testing & Personalized Medicine

Pathogen Detection & Antibiotics

M098.c **3D PRINTED RASPBERRY PI MICROSCOPY FOR LOW COST MICROFLUIDIC BACTERIAL MOTILITY ANALYSIS**

Tai The Diep and Alexander Daniel Edwards
University of Reading, UK

M099.c **A MICROFLUIDIC MODULE FOR INTEGRATED LYSIS AND GENETIC MATERIAL DETECTION OF GRAM-POSITIVE AND GRAM-NEGATIVE BACTERIA**

Catarina R.F. Caneira[1], Sílvia Monteiro[2], Ricardo Santos[2], Virginia Chu[1], and João P. Conde[1,2]
[1] *INESC-MN, PORTUGAL and* [2] *Universidade de Lisboa, PORTUGAL*

M100.c **BACTERIAL IDENTIFICATION BY OPTICAL MAPPING OF GENOMIC DNA IN NANOFLUIDIC CHANNELS**

My Nyblom[1], Vilhelm Müller[1], Anna Johhning[1,2,3], Marie Wrande[4], Albertas Dvirnas[5], Sriram KK[1], Christian G. Giske[6,7], Tobias Ambjörnsson[5], Linus Sandegren[4], Erik Kristiansson[3], and Fredrik Westerlund[1]
[1] *Chalmers University of Technology, SWEDEN,* [2] *Fraunhofer-Chalmers Centre, SWEDEN,* [3] *University of Gothenburg, SWEDEN,* [4] *Uppsala University, SWEDEN,* [5] *Lund University, SWEDEN,* [6] *Karolinska Institute, SWEDEN, and* [7] *Karolinska University Hospital, SWEDEN*

M101.c **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

M102.c **LABEL-FREE BACTERIAL SMARTPHONE DETECTION IN MICRO CAPILLARY FILM ALLOWS RAPID TESTING OF THERAPEUTIC BACTERIOPHAGE SPECIFICITY**

Sultan İlayda Dönmez, Sarah Needs, Mojgan Rabiey, Helen Osborn, and Alexander Edwards
University of Reading, UK

Pathogen Detection & Antibiotics

M103.c **MICROFLUIDICS COUPLED MASS SPECTROMETRY REVEALS METABOLOMIC VARIATIONS DURING MORPHOLOGICAL CHANGES OF BACTERIA UNDER THE IMPACT OF ANTIBIOTICS**

Dongxue Zhang and Liang Qiao
Fudan University, CHINA

M104.c **RAPID SEPARATION AND DETECTION OF RARE FUNGI SPORES FROM WHOLE BLOOD BASED ON A DUAL-LAYER MICROPORE ARRAYED FILTRATION**

Wenbo Zhou[1], Yaoping Liu[1], Shuangling Li[2], Meng Xiao[3], Jie Gong[4], Hang Li[2], and Wei Wang[1,5]
[1]*Peking University, CHINA,* [2]*Peking University First Hospital, CHINA,* [3]*Peking Union Medical College Hospital, CHINA,* [4]*Chinese Center for Disease Control and Prevention, CHINA, and* [5]*National Key Laboratory of Science and Technology on Micro/Nano Fabrication, CHINA*

M105.c **USE OF MINIATURIZED DEVICES AND ISOTHERMAL AMPLIFICATION FOR PATHOGEN DETECTION IN THE FIELD**

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

T097.c **A DROPLET MICROFLUIDICS PLATFORM FOR SCALABLE AND HIGH-THROUGHPUT ISOLATION OF ANTIBIOTIC-PRODUCING MICROBES**

Pieter Berden[1,2,3], Camila D. Campos[1,2], Rodrigo S. Wiederkehr[1], Liesbet Lagae[1,2], Tim Stakenborg[1], Jan Michiels[2,3], and Maarten Fauvart[1,2,3]
[1]*Imec, BELGIUM,* [2]*KU Leuven, BELGIUM, and* [3]*VIB, BELGIUM*

T098.c **A MULTIPLEXED ASSAY SYSTEM FOR PATHOGEN DETECTION BASED ON ENCODED MAGNETIC MICROPARTICLES**

Young Ki Hahn[1], Ji Hyun Kim[2], and Honggu Chun[2]
[1]*Kyungpook National University, KOREA and* [2]*Korea University, KOREA*

T099.c **BACTERIAL PATHOGENS DETECTION AND ANTIMICROBIAL RESISTANCE TESTING USING PAPER-BASED DEVICES FOR URINARY TRACT INFECTIONS (UTIS)**

Peijun J.W. He[1], Ioannis N. Katis[1], Anto J.U. Kumar[1], Catherine A. Bryant[1], Charles W. Keevil[1], Bhaskar K. Somani[2], Nitin Mahobia[2], Robert W. Eason[1], and Collin L. Sones[1]
[1]*University of Southampton, UK and*
[2]*University Hospital Southampton NHS Trust, UK*

T100.c **FISH AND CHIPS-IFAST MICROFLUIDIC DEVICE FOR *E. coli* 0157:H7 CAPTURE AND DETECTION VIA ON-CHIP FISH ASSAY**

Pablo Rodriguez-Mateos[1], Celia F. Rodrigues[2], Nuno F. Azevedo[2], Carina Almeida[3,4], Charlotte E. Dyer[1], Alex Iles[1], and Nicole Pamme[1]
[1]*University of Hull, UK,* [2]*University of Porto, PORTUGAL,* [3]*National Institute for Agricultural and Veterinary Research, PORTUGAL, and* [4]*Biomode SA, PORTUGAL*

Pathogen Detection & Antibiotics

T101.c **MICRO-SCALE IMMUNOMAGNETIC BACTERIAL ENRICHMENT COUPLED TO NANOPLASMONIC SENSING FOR RAPID DETECTION OF PATHOGENS IN WHOLE BLOOD**
Alison Burklund[1], Amogha Tadimety[1], and John X.J. Zhang[1,2]
[1] *Dartmouth College, USA and* [2] *Darthmouth-Hitchcock Medical Center, USA*

T102.c **MOLECULAR DIAGNOSIS OF INFECTIOUS DISEASES FOR POINT-OF-CARE USING DNA HYDROGEL BASED REPID KIT**
Hwang-soo Kim, Ho Yoon Lee, Chan Hee Park, Hynsung Kim, Young Joon Kim, Jin A. Choi, and Sehyun Shin
Korea University, KOREA

T103.c **RATIOMETRIC MULTIPLEXED DIGITAL PCR FOR BACTERIAL IDENTIFICATION AND PHENOTYPIC AST OF POLYMICROBIAL SAMPLES**
Fan-En Chen, Alexander Y. Trick, Liben Chen, Joon Soo Park, and Jeff Tza-Huei Wang
Johns Hopkins University, USA

W098.c **A MICROFLUIDIC SYSTEM INTEGRATING MEMBRANE FILTRATION AND SURFACE-ENHANCED RAMAN SCATTERING FOR RAPID ANTIBIOTIC SUSCEPTIBILITY TEST**
Kai-Wei Chang and Nien-Tsu Huang
National Taiwan University, TAIWAN

W099.c **A SELF-CONTAINED INTEGRATED NUCLEIC ACID ANALYSIS CASSETTE FOR MULTIPLEXED BACTERIA DETECTION**
Nan Li[1], Minjie Shen[1], and Youchun Xu[1,2]
[1] *Tsinghua University, CHINA and* [2] *National Engineering Research Center for Beijing Biochip Technology, CHINA*

W100.c **DISCRIMINATING DRUG-RESISTANT BACTERIA USING AI ANALYSIS ON FINE CURRENT CHANGES FROM INNER ION LEAKAGES**
Aomi Yoshikawa[1], Takao Yasui[1], Taisuke Shimada[1], Seiji Yamasaki[2], Kunihiko Nishino[2], Takeshi Yanagida[2,3], Kazuki Nagashima[3], Takashi Washio[2], Tomoji Kawai[2], and Yoshinobu Baba[1,4]
[1] *Nagoya University, JAPAN,* [2] *Osaka University, JAPAN,* [3] *Kyushu University, JAPAN, and* [4] *National Institute of Advanced Industrial Science and Technology, JAPAN*

W101.c **FULL INTEGRATION OF SAMPLE PREPARATION AND DNA ANALYSIS FOR FAST MULTIPLEX FIELD-IDENTIFICATION OF BACTERIA**
Remco den Dulk[1], Camille Echampard[1], Perrine Viargues[1], Fabienne Gas[2], Florent Decugis[2], Mélissa Baqué[1], Anne-Gaëlle Bourdat[1], Manuel Alessio[1], Sandrine Alais[3], Jehanne Oudot[3], Olivier Riffard[3], Cédric Pasquier[3], Gregory Wenisch[3], and Jean-Maxime Roux[1]
[1] *CEA-Leti, FRANCE,* [2] *CEA-DRF, FRANCE, and* [3] *SDMIS, FRANCE*

Pathogen Detection & Antibiotics

W102.c MULTIPLEXED OPTICAL DNA MAPPING TO IDENTIFY PLASMIDS AND THEIR RESISTANCE GENES IN FECAL SAMPLES
Sriram KK[1], Yii-Lih Lin[1], Tsegaye Sewunet[2,3], Shoeib Nematzadeh[3], Christian G. Giske[3,4], and Fredrik Westerlund[1]
[1]Chalmers University of Technology, SWEDEN, [2]Jimma University, ETHIOPIA, [3]Karolinska Institutet, SWEDEN, and [4]Karolinska University Hospital, SWEDEN

W103.c PALM-SIZED MAGNETOFLUIDIC PLATFORM FOR BACTERIAL IDENTFICATION AND ANTIMICROBIAL SUSCEPTIBILITY TESTING OF INFECTED WOUNDS
Pei-Wei Lee, Liben Chen, Alexander Y. Trick, Pornpat Athamanolap, Fan-En Chen, and Tza-Huei Wang
Johns Hopkins University, USA

W104.c SMARTPHONE-BASED DETECTION OF VIBRIO CHOLERAE IN ENVIRONMENTAL WATER SAMPLES USING PARTICLE DIFFUSOMETRY
Taylor J. Moehling[1], Dong Hoon Lee[1], Katherine N. Clayton[2], Steven T. Wereley[1], Tamara L. Kinzer-Ursem[1], and Jacqueline C. Linnes[1]
[1]Purdue University, USA and [2]OmniVis LLC, USA

c - Diagnostics, Drug Testing & Personalized Medicine

Personalized Medicine

M106.c DEVELOPMENT OF A MICROFLUIDIC PLATFORM FOR TARGETED PHAGE SELECTION: IN PURSUIT OF PERSONALIZED COLORECTAL CANCER TREATMENTS
Eduardo J.S. Brás, Pedro G.M. Condelipes, Pedro M. Fontes, Ricardo F. Serrão, Vanda Marques, Marta B. Afonso, Cecília M.P. Rodrigues, Virginia Chu, João Gonçalves, and João Pedro Conde
Universidade de Lisboa, PORTUGAL

T104.c DROPLET-BASED SINGLE EXTRACELLULAR VESICLE SEQUENCING FOR RARE IMMUNE SUBTYPE DISCOVERY
Jina Ko[1], Yongcheng Wang[2], Jeremy Gungabeesoon[1], Mikael Pittet[1], David Weitz[2], and Ralph Weissleder[1]
[1]Massachusetts General Hospital, USA and [2]Harvard University, USA

T105.c QUAD MICRORAFT ARRAYS AS A PLATFORM FOR GENERATING AND SELECTING HUMAN INDUCED PLURIPOTENT STEM CELLS FROM PERIPHERAL BLOOD
Nicole M. Smiddy[1], Adriana S. Beltran[2], and Nancy L. Allbritton[1,3]
[1]University of North Carolina, USA, [2]University of North Carolina School of Medicine, USA, and [3]North Carolina State Univeristy, USA

W105.c DRUG METABOLISM-IN-A-DROPLET: A DIGITAL MICROFLUIDIC APPROACH TOWARD PRECISION MEDICINE
Gowtham Sathyanarayanan, Markus Haapala, and Tiina Sikanen
University of Helsinki, FINLAND

c - Diagnostics, Drug Testing & Personalized Medicine

Protein Analysis & Characterization (e.g., Proteomics)

M107.c **TRANSPEPTIDASE-MEDIATED *IN-SITU* COVALENT IMMOBILIZATION OF CELL-FREE SYNTHESIZED ENZYME FOR ON-CHIP DIRECTED EVOLUTION**

Shingo Ueno[1,2], Yui Shirakata[1], Mika Shioya[1], Shusuke Sato[1,2], Shoichi Tsuchiya[1], and Takanori Ichiki[1,2]
[1] *Innovation Center of NanoMedicine, JAPAN and*
[2] *University of Tokyo, JAPAN*

T106.c **INTEGRATED AND AUTOMATED MICROFLUIDIC PORTABLE INSTRUMENTATION FOR WHOLE BLOOD SAMPLE PREPARATION IN PROTEOMICS ANALYSIS**

Myriam Cubizolles, Remco Den Dulk, Benoit Gilquin, Frédéric Revol-Cavalier, Manuel Alessio, Charles-Elie Goujon, Camille Echampard, Gorka Arrizabalaga, Yohann Couté, Annie Adrait, Mathilde Louwagie, Patricia Laurent, Fabrice Navarro, Marie-Line Cosnier, and Virginie Brun
University Grenolble Alps, FRANCE

W106.c **DRIED BLOOD SPOT RECOVERY: A MICROFLUIDIC TECHNIQUE FOR FAST ELUTION WITHOUT DILUTION**

Etienne Coz[1], Pierre Garneret[1], Didier Chevenne[2], Jean-François Benoist[2], Fabrice Monti[1], and Patrick Tabeling[1]
[1] *ESPCI-Paris, FRANCE and* [2] *Hospital Robert-Debré, FRANCE*

W107.c **THE INFLUENCE OF SHEAR ON PROTEIN CRYSTALLIZATION UNDER CONSTANT SHEAR CONDITIONS**

Sander Stroobants[1], Marzena Krzek[1], Pierre Gelin[1], Iwona Ziemecka[1], James F. Lutsko[2], Wim De Malsche[1], and Dominique Maes[1]
[1] *Vrije Universiteit Brussel, BELGIUM and*
[2] *Université Libre de Bruxelles, BELGIUM*

c - Diagnostics, Drug Testing & Personalized Medicine

Regenerative Medicine & Tissue Engineering

M108.c **HIERARCHICAL ASSEMBLY OF COLLAGEN MOLECULES INTO TISSUE-ENGINEERED ARTERIAL CONSTRUCTS**

Shashi Malladi[1], David M. Nieves[2], Carloyn Haller[2,3], Elliot L. Chaikof[2,3], and Axel Guenther[1]
[1] *University of Toronto, CANADA,* [2] *Harvard University, USA, and*
[3] *Beth Israel Deaconess Medical Center, USA*

T107.c **CELL-ENCAPSULATING CHITOSAN-COLLAGEN HYBRID HYDROGEL CONDUIT FOR PERIPHERAL NERVE REGENERATION**

Shun Itai[1], Karin Suzuki[1], Yuta Kurashina[2], Hiroo Kimura[1], Tsuyoshi Amemiya[1], Kazuki Sato[1], Masaya Nakamura[1], and Hiroaki Onoe[1]
[1] *Keio University, JAPAN and* [2] *Tokyo Institute of Technology, JAPAN*

Regenerative Medicine & Tissue Engineering

T108.c **SYNERGISTIC ELECTRO-MECHANICAL TRANSFECTION FOR *IN-VIVO* REGENERATIVE THERAPY USING ELECTRICALLY-INDUCED MICROBUBBLES**

Akiho Hirao[1], Keiko Miwa[1], Yasuhiro Moriizumi[2], and Yoko Yamanishi[1]
[1] *Kyusyu University, JAPAN and* [2] *BEX Co., Ltd., JAPAN*

W108.c **ENGINEERED ADAPTIVE IMMUNE RESPONSE BY MICROFLUIDICALLY FABRICATED SCAFFOLD IMPARTS REGENERATIVE WOUND HEALING**

Maani M. Archang[1], Donald R. Griffin[2], Westbrook M. Weaver[1], Jason S. Weinstein[3], Amber Ruccia[4], An Chieh Feng[4], Elias Sideris[1], Jaekyung Koh[1], Dino Di Carlo[1], Tatiana Segura[1,4], and Philip O. Scumpia[1,5]
[1] *University of California, Los Angeles, USA,* [2] *University of Virginia, USA,* [3] *Rutgers –New Jersey Medical School, USA,* [4] *Duke University, USA, and* [5] *VA Greater Los Angeles Healthcare System, USA*

W109.c **VERTICAL NANOSTRUCTURED FLEXIBLE ANTI-PATHOGENIC SCAFFOLDS FOR STEM CELL AND TISSUE ENGINEERING**

Sunho Park[1], Hyun-Ha Park[2], Kahyun Sun[2], Minho Seong[2], Sujin Kim[1], Hoon Eui Jeong[2], and Jangho Kim[1]
[1] *Chonnam National University, KOREA and*
[2] *Ulsan National Institute of Science and Technology (UNIST), KOREA*

c - Diagnostics, Drug Testing & Personalized Medicine

Others

M109.c **A CONVERSATIONAL ROBOTIC LAB ASSISTANT FOR AUTOMATED MICROFLUIDIC 3D MICROTISSUE PRODUCTION**

Krzysztof Langer[1], Sandra Jernström[2], Piia Mikkonen3, Päivi Östling[2], Brinton Seashore-Ludlow[2], and Haakan N. Joensson[1]
[1] *KTH Royal Institute of Technology, SWEDEN,* [2] *Karolinska Institutet, SWEDEN, and* [3] *University of Helsinki, FINLAND*

M110.c **A RAPID ENZYMATIC ASSAY FOR NEAR-PATIENT MEASUREMENT OF ADHERENCE TO HIV PRE-EXPOSURE PROPHYLAXIS**

Ayokunle O. Olanrewaju[1], Benjamin Sullivan[1], Jane Y. Zhang[1], Andrew T. Bender[1], Tiffany J. Lo[1], Derin Sevenler[2], Marta Fernandez-Suarez[3], Paul K. Drain[1], and Jonathan D. Posner[2]
[1] *University of Washington, USA,* [2] *Harvard Medical School, USA, and* [3] *Independent Contractor, USA*

T109.c **REAL-TIME MEASUREMENT OF THE PHYSICAL PROPERTIES OF DNA-LIGAND COMPLEXES**

Deniz Pekin[1], Grégoire Perret[2], Momoko Kumemura[3], Laurent Jalabert[2], Samuel Meignan[4], Hiroyuki Fujita[2], Dominique Collard[2], and Mehmet C. Tarhan[5]
[1] *Inserm, FRANCE,* [2] *LIMMS/CNRS-IIS, FRANCE,* [3] *Kyushu Institute of Technology, JAPAN,* [4] *Centre Oscar Lambret, FRANCE, and* [5] *University Lille, FRANCE*

Others

T110.c **SALIVARY MICRORNA CORECTION AND ANALYSIS USING NANOCELLULOSE FOR DOMICILIARY CANCER DIAGNOSIS**
Naoya Misukami[1], Takao Yasui[1], Hironao Koga[2], and Yoshinobu Baba[1,3]
[1]*Nagoya University, JAPAN,* [2]*Osaka University, JAPAN, and* [3]*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*

W110.c **RAPID AND PORTABLE PRESUMPTIVE TESTING OF NEW PSYCHOACTIVE SUBSTANCES**
Lauren F. McNeill, Marios Savvos, Oliver B. Sutcliffe, David P. Megson, Patricia E. Linton, and Kirsty J. Shaw
Manchester Metropolitan University, UK

d - Fundamentals in Microfluidics and Nanofluidics

Acousto- and Magnetofluidics

M111.d **LABEL-FREE SURFACE ACOUSTIC WAVE-BASED EMBEDDED FLOW SENSOR**
Aurore Quelennec, Jason J. Gorman, and Darwin R. Reyes
National Institute of Standards and Technology (NIST), USA

T111.d **NEW UNDERSTANDING OF ACOUSTOFLUIDIC DROP DISPENSING FOR DIGITAL MICROFLUIDICS USING SURFACE ACOUSTIC WAVES**
Elijah Nazarzadeh, Christian Witte, Julien Reboud, and Jonathan M. Cooper
University of Glasgow, UK

W111.d **HIGH THROUGHPUT CONTINUOUS CELL SECRETOME SEPARATION INSIDE MICROSCALE DROPLETS BY MEANS OF ACOUSTOPHORESIS**
Michael Gerlt, Dominik Haidas, Alexandre Ratschat, Philipp Suter, Petra S. Dittrich, and Jürg Dual
ETH Zürich, SWITZERLAND

W112.d **SURFACE ACOUSTIC WAVES PLATFORM FOR TARGETED DELIVERY OF LIPOSOMAL SIRNA AND DNA PLASMID**
Xi King[1], Elijah Nazarzadeh[1], Manlio Tassieri[1], Julien Reboud[1], Jenny K.W. Lam[2], and Jonathan M. Cooper[1]
[1]*University of Glasgow, UK and* [2]*University of Hong Kong, CHINA*

d - Fundamentals in Microfluidics and Nanofluidics

Centrifugal Microfluidics

M112.d **AN AUTOMATED CENTRIFUGAL MICROFLUIDIC SYSTEM INTEGRATED WITH ETALON SENSOR FILMS FOR RAPID IMAGE ANALYSIS BASED DETECTION OF HORMONES IN MILK**
Yuting Hou[1], Rohit Mishra[2], Menglian Wei[1], Nicholas Balasuriya[1], Jens Ducrée[2], Michael J. Serpe[1], and Jed Harrison[1]
[1]*University of Alberta, CANADA and* [2]*Dublin City University, IRELAND*

M113.d **SEPARATION AND CHROMOGENIC DETECTION OF MIXED ILLICIT DRUG SAMPLES FOR POINT-OF-INTERDICTION TESTING**
Killian C. O'Connell, M. Shane Woolf, and James P. Landers
University of Virginia, USA

Centrifugal Microfluidics

M114.d **PHASE-SEPARATED CORE-SHELL HYDROGEL MICROBEADS FROM HOMOGENEOUS MIXED POLYMER SOLUTION BY SIMULTANEOUS GELATION**
Yuta Kurashina[1,2], Mio Tsuchiya[1], Keitaro Kasahara[1], and Hiroaki Onoe[1]
[1] *Keio University, JAPAN and* [2] *Tokyo Institute of Technology, JAPAN*

T112.d **ARTIFICIAL GUT-ON-A-DISC PLATFORM TO EVALUATE PH SENSITIVE COATINGS OF ORAL DRUG DELIVERY DEVICES**
Sriram Thoppe Rajendran[1,2], Khorshid Kamguyan[1], David Kinahan[2], En-Te Hwu[1], Line Hagner Nielsen[1], Kinga Zór[1], and Anja Boisen[1]
[1] *Technical University of Denmark, DENMARK and*
[2] *Dublin City University, IRELAND*

T113.d **ON-DISC DROPLET FUSION FOR CELL TRANSFECTION**
Yuye Wang, Shiyue Liu, Siu-kai Kong, and Ho-Pui Ho
Chinese University of Hong Kong, HONG KONG

T114.d **REVERSIBLE VALVING SOLUTIONS FOR CENTRIFUGAL PLATFORMS WHILE SPINNING**
Saraí M. Torres Delgado[1], Moritz Huber[1], Bahman Moradi[2], Jan G. Korvink[1], Christof Megnin[2], and Dario Mager[1]
[1] *Karlsruhe Institute of Technology, GERMANY and*
[2] *MEMETIS GmbH, GERMANY*

W113.d **AUTONOMOUS MULTIPLEXED CENTRIFUGAL DEVICE TO EXECUTE FULLY AUTOMATED SANDWICH ELISA WITH MINIMUM REAGENTS LOADING OPERATION**
Shunya Okamoto[1,2] and Yoshiaki Ukita[1]
[1] *University of Yamanashi, JAPAN and* [2] *JSPS Research Fellow, JAPAN*

W114.d **HIGH THROUGHPUT GENERATION OF CALCIUM-ALGINATE MICRO-PARTICLES USING CENTRIFUGAL FORCE-BASED DEVICE FOR CELLS ENCAPSULATION**
Thi Huong Le[1], Van Thuy Duong[1], Huu Lam Phan[1], Chanh Trung Nguyen[1], Hang Phuong Nguyen[1], Hyewon Son[1], Seok Oh[1], HyoSoek Lee[1], Suwon Lee[1], Changho Hwang[2], and Kyo-in Koo[1]
[1] *University of Ulsan, KOREA and*
[2] *University of Ulsan College of Medicine, KOREA*

W115.d **THE CENTRIFUGO-PNEUMATIC LAB-ON-A-DISK PLATFORM: TOWARDS ROBUST FLOW CONTROL FOR LARGER-SCALE FUNCTIONAL INTEGRATION**
Lars H. von Deyn and Jens Ducrée
Dublin City University, IRELAND

d - Fundamentals in Microfluidics and Nanofluidics

Digital Microfluidics

M115.d **AN ELECTRONICALLY-CONTROLLED DIGITAL FERROFLUIDIC ARCHITECTURE FOR SCALABLE AND ADDRESSABLE BIOANALYTICAL OPERATIONS**
Wenzhuo Yu, Yilian Wang, Haisong Lin, Nathan Chen, Xu He, Kevin Sun, Dino Di Carlo, and Sam Emaminejad
University of California, Los Angeles, USA

M116.d **DROPLET EVAPORATION PROFILES IN DIAMAGNETIC LEVITATION**
Vincent Haguet[1], Sergey Semenov[2], Christian Jeandey[1], and Mickaël Antoni[2]
[1] *CEA Grenoble, FRANCE and* [2] *Aix-Marseille Université, FRANCE*

M117.d **POINT-OF-CARE DIAGNOSIS OF RESPIRATORY SYNCYTIAL VIRUS BY DIGITAL NANOBUBBLE DETECTION**
Yaning Liu[1], Haihang Ye[1], Ruth Levitz[1], HoangDinh Huynh[1], Jeffrey Kahn[1], and Zhenpeng Qin[1,2]
[1] *University of Texas, Dallas, USA and*
[2] *University of Texas Southwestern Medical Center, USA*

T115.d **PATHWAY ENGINEERING USING RAPID-PROTOTYPE DIGITAL MICROFLUIDICS**
James M. Perry, Guy Soffer, Ehsan Moazami, and Steve C.C. Shih
Concordia University, CANADA

T116.d **IMPROVED DYNAMICS FOR DROPLET ACTUATION BY STRATEGICALLY USING TRIANGULAR COPLANAR ELECTRODES IN DIGITAL MICROFLUIDIC SYSTEM**
Mainak Basu, Soumen Das, and Sunando DasGupta
Indian Institute of Technology Kharagpur, INDIA

T117.d **ULTRA-LOW-FREQUENCY INDUCED TINY DROPLET TRANSPORTATION WITH SMALL DROPLET-TO-ELECTRODE AREA RATIO IN DIGITAL MICROFLUIDIC PLATFORMS**
Mingzhong Li[1], Man-Kay Law[1], Pui-In Mak[1], and Rui P. Martins[1,2]
[1] *University of Macau, CHINA and* [2] *Universidade de Lisboa, Portugal*

W116.d **DIELECTROPHORETIC TRAPPING OF NON-STATIONARY FLOATING LIQUID MARBLES**
Jing Jin, Chin H. Ooi, Kamalalayam R. Sreejith, Dzung V. Dao, and Nam-Trung Nguyen
Griffith University, AUSTRALIA

W117.d **INTEGRATED MAGNETOFLUIDIC NUCLEIC ACID PURIFICATION WITH DIGITAL PCR AND HIGH-RESOLUTION MELT FOR BACTERIAL IDENTIFICATION**
David E. Gaddes, Pornpat Athamanolap, Alexander Y. Tric, Christine M. O'Keefe, Fan-Eh Chen, and Tza-Huei Wang
Johns Hopkins University, USA

d - Fundamentals in Microfluidics and Nanofluidics

Droplet Microfluidics

M118.d AUTOMATED DROPLET SAMPLING OF ENDOCRINE TISSUE WITH DOWNSTREAM MERGERS FOR COMBINATORIAL MIX-AND-READ ASSAYS
Christopher J. Easley[1], Nan Shi[1], and Juan Hu[2]
[1]*Auburn University, USA and* [2]*Scripps Research, USA*

M119.d BUBBLE BREAKUP IN AN EXPANSION MEDIATED MICROFLUIDIC CHANNEL
Alinaghi Salari[1,2], Jiang Xu[1,2], Michael C. Kolios[1,2], and Scott Tsai[1,2]
[1]*Institute for Biomedical Engineering, Science and Technology (iBEST), CANADA and* [2]*Ryerson University, CANADA*

M120.d DEEP LEARNING GUIDED IMAGE-BASED DROPLET SORTING FOR BIOLOGICAL SCREENINGS
Vasileios Anagnostidis[1], Benjamin Sherlock[1], Jeremy Metz[1], Philip Mair[2], Florian Hollfelder[2], and Fabrice Gielen[1]
[1]*University of Exeter, UK and* [2]*University of Cambridge, UK*

M121.d FEMTOLITER-DROPLET SHOOTING BY MICRO/NANO FLUIDICS FOR DIGITAL MASS SPECTROMETRY
Yuto Takagi, Yutaka Kazoe, and Takehiko Kitamori
University of Tokyo, JAPAN

M122.d LABEL-FREE DROPLET DETECTION THROUGH 3D ELECTRODE-BASED IMPEDANCE SPECTROSCOPY
Hyun Soo Kim[1], Sunghyun Cho[1], Hyesoo Park[1], Kang-Ho Lee[1], Ohwon Kwon[1], Younghak Cho[2], and Jaewon Park[3]
[1]*Korea Institute of Machinery and Materials (KIMM), KOREA,*
[2]*Seoul National University of Science and Technology, KOREA, and*
[3]*Southern University of Science and Technology, KOREA*

M123.d MICRO PERISTALTIC PUMP SYSTEM FOR THE GENERATION OF ARBITRARY DROPLET SEQUENCE AND MULTIPLE-STEP BIOCHEMICAL ASSAYS
Wahida Bhuiyan, Gareth Evans, and Xize Niu
University of Southampton, UK

M124.d NON-NEWTONIAN, HIGH VISCOSITY POLYMER BLENDS WITHIN DROPLET MICROFLUIDIC DEVICES
Polly Sanders, Solweig Chartier, Alexander Iles, Jia Min Chin, and Nicole Pamme
University of Hull, UK

M125.d PARALLEL BACTERIAL ESTERASE ASSAY IN TRAPPED 35 nL-DROPLETS USING pL-EMULSION TRANSPORT
Charmi Chande[1], Jialan Cao[1], Thomas Henkel[2], Marc Kielpinskie[2], J. Michael Köhler[1], and G. Alexander Groß[1]
[1]*Ilmenau University of Technology, GERMANY and*
[2]*Leibnitz Institute for Photonic Technology, GERMANY*

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M126.d SELECTIVE PARTITIONING OF MICRODROPLETS USING HORIZONTAL MICROVALVES

Mohammad Reza Raveshi[1], Sagar N. Agnihotri[2], Muhsincan Sesen[1], Rajneesh Bhardwaj[2], and Adrian Neild[1]
[1]*Monash University, AUSTRALIA and*
[2]*Indian Institute of Technology, Bombay, INDIA*

M127.d SIMULTANEOUS MICRODROPLETS GENERSTION BY TAIL BREAKUP INDUCED WITH MULTI-BRANCH CHANNEL

Satsuki Kajiya[1], Dong Hyun Yoon[1], Yoshito Nozaki[1], Taisuke Isano[2], Hitoshi Yamagata[2], Hiroyuki Fujita[2], Tetsushi Sekiguchi[1], and Shuichi Shoji[1]
[1]*Waseda University, JAPAN and* [2]*Canon Medical Systems Corp., JAPAN*

M128.d TRYPANOFLUIDICS: VARIABILITY OF ENZYMATIC RESPONSE IN POPULATIONS OF TRYPANOSOMES

Simone H. Oldenburg[1], Deniz Pekin[1], Lionel Buisson[1], Thomas Beneyton[1], Jean-Christophe Baret[1,2], and Loïc Rivière[1]
[1]*Université de Bordeaux, FRANCE and*
[2]*Institut Universitaire de France, FRANCE*

T118.d BIOCOMPATIBLE POLYELECTROLYTE MICROCAPSULES GENERATED WITH MAGNETIC WATER-IN-WATER DROPLET MICROFLUIDICS

Maryam Navi[1,2,3], Jennifer Kieda[1,2,3], Niki Abbasi[1,2,3], and Scott Tsai[1,2,3]
[1]*Ryerson University, CANADA,* [2]*St. Michael's Hospital, CANADA, and* [3]*Institute for Biomedical Engineering Science, and Technology (iBEST), CANADA*

T119.d CONTINUOUS FLOW CELL-CELL INTERACTION SCREENING VIA A SEQUENTAL INJECTOR

Weikang Nicholas Lin[1], Shih-Chung Wei[2], Matthew Zirui Tay[3], Lu Ri[4], and Chia-Hung Chen[1,2]
[1]*National University of Singapore, SINGAPORE,* [2]*Institute for Health Innovation & Technology (iHealthtech), SINGAPORE,* [3]*Singapore Immunology Network (SIgN), SINGAPORE, and* [4]*NUS Graduate School for Integrated Sciences and Engineering, SINGAPORE*

T120.d DROP-QPCR: A DROPLET MICROFLUIDIC PLATFORM FOR FAST AND CONTINUOUS-FLOW QPCR ANALYSIS

Ismail Hajji[1], Mathilde Richerd[1], Simon Dumas[1], Charles Cavaniol[1], Lauriane Geremie[1], Marco Serra[1], Renaud Renault[1], Ivan Ferrante[1], Jean-Louis Viovy[1], Stéphanie Descroix[1], and Davide Ferraro[1,2]
[1]*Institut Curie, FRANCE and* [2]*Università di Padova, ITALY*

T121.d HIGH THROUGHPUT SCREENING OF PLASTIC-DEGRADING MICROBES USING DROPLET MICROFLUIDICS

Yuxin Qiao, Dongwei Chen, Haiyan Yu and Wenbin Du
Chinese Academy of Sciences, CHINA

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T122.d MASSIVELY-PARALLELIZED PRODUCTION OF FEMTOLITER DROPLETS AND ITS APPLICATION TO SELF-ASSEMBLED NANOPARTICLE CLUSTERS FOR NOVEL METAMATERIALS

Corentin B.M. Tregouet[1], Chris L. Kennedy[2], Ramakrishna Kotni[2], Sofie Kölling[3], Johan G. Bomer[3], Jasper J.A. Lozeman[3], Detlef Lohse[3], Albert van den Berg[3], Alfons van Blaaderen[2], and Mathieu Odijk[3]
[1] *Université Rennes 1, FRANCE,* [2] *Utrecht University, THE NETHERLANDS, and* [3] *University of Twente, THE NETHERLANDS*

T123.d MICRONEEDLE-ASSISTED MICROFLUIDIC FLOW FOCUSING PLATFORM TO GENERTE WATER-IN-WATER MICRODROPLETS IN A HIGH-THROUGHPUT MANNER

Morteza Jeyhani[1,2,3], Vaskar Gnywali[1,2,3], Niki Abbasi[1,2,3], Dae Kun Hwang[1,2,3], and Scott S.H. Tsai[1,2,3]
[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 Babahosseini[1,2], Tom Misteli[1], and Don L. DeVoe[2]
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[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 Hattori[1], Dong Hyun Yoon[1], Yoshito Nozaki[1], Taisuke Isano[2], Hitoshi Yamagata[2], Hiroyuki Fujita[2], Tetsushi Sekiguchi[1], and Shuichi Shoji[1]
[1] *Waseda University, JAPAN and*
[2] *Canon Medical Systems Corp., JAPAN*

T127.d SUPERPARAMAGNETIC NANOPARTICLE ENCAPSULATION VIA DROPLET-BASED MICROFLUIDICS FOR TARGETED DRUG DELIVERY SYSTEM

Sakon Rahong[1], Ratchanont Sukthai[1], Narin Paiboon[2], Kunat Suktham[2], Annop Klamchuen[2], and Suvimol Surassmo[2]
[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-Ui Moon, Lidija Malic, Keith Morton, Abdelrahman Elmanzalawy, and Teodor Veres
National Research Council Canada, CANADA

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W118.d A PORTABLE DROPLET SORTING PLATFORM WITH INTEGRATED THERMOCAPILLARY SORTING AND CAPACITANCE DETECTING
Yigang Shen[1,2], Yaxiaer Yaliku[1,3], Yusufu Aishan[1,2], and Yo Tanaka[1,2]
[1] *RIKEN, JAPAN,* [2] *Osaka University, JAPAN, and*
[3] *Nara Institute of Science and Technology, JAPAN*

W119.d CLIMBING DROPLETS DRIVEN BY MECHANOWETTING
Ye Wang[1,2], Edwin de Jong[3], Patrick R. Onck[3],
and Jaap M.J. den Toonder[1,2]
[1] *Eindhoven University of Technology, THE NETHERLANDS,*
[2] *Institute for Complex Molecular Systems, THE NETHERLANDS, and*
[3] *University of Groningen, THE NETHERLANDS*

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 Armbrecht, and Petra S. Dittrich
ETH Zürich, SWITZERLAND

W121.d FABRICATION AND EVALUATION OF ATTOLITER DROPLETS
Risa Takane[1], Hiroto Kawagishi[1], Yasunori Matsui[1],
Hiroshi Ikeda[1], and Yan Xu[1,2]
[1] *Osaka Prefecture University, JAPAN and*
[2] *Japan Science and Technology Agency (JST), JAPAN*

W122.d IMPROVING DNA LIBRARY PREPARATION FOR NEXT GENERATION SEQUENCING THANKS TO AN INNOVATIVE DROPLET MICROFLUIDIC DEVICE
Davide Ferraro[1,2], Marco Serra[1], Thanh Duc Mai[1,3], Almut Eisele[1],
Leïla Périé[1], Jean-Louis Viovy[1], and Stephanie Descroix[1]
[1] *Institut Curie, FRANCE,* [2] *University of Padova, ITALY, and*
[3] *Institut Galien de Paris-Sud, FRANCE*

W123.d MICRODROPLET ARRAY CONCENTRATION WITH SIZE-TRIGGERED RELEASE SYSTEM
Piangrawee Santivongskul[1], Mao Fukuyama[1,2],
and Akihide Hibara[1]
[1] *Tohoku University, JAPAN and*
[2] *Japan Science and Technology Agency (JST), JAPAN*

W124.d MULTIPLEXING ANTIBIOTIC SCREENING IN DROPLET MICROFLUIDICS USING AN OPTOFLUIDIC PLATFORM
Sundar Hengoju[1,2], Lisa Mahler[1], Oksana Shvydkiv[1],
Miguel Tovar[1], Miriam Rosenbaum[1,2], and Martin Roth[1]
[1] *Hans Knöll Institute, GERMANY and*
[2] *Friedrich 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

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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-Dauzier[1,2], Robin Deteix[1,2], Matthieu Denoual[2,3], Soo Hyeon Kim[1], Hiroshi Toshiyoshi[1,2], Hiroyuki Fujita[4], Teruo Fujii[1,2], and Anthony J. Genot[2]
[1] *University of Tokyo, JAPAN,* [2] *LIMMS-IIS/CNRS, FRANCE,* [3] *Greyc – ENSICAEN/CNRS, FRANCE, and* [4] *Tokyo City University, JAPAN*

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 Calero[1], Pablo Garcia-Sanchez[2], Antonio Ramos[2], and Hywel Morgan[1]
[1] *University of Southampton, UK and* [2] *Universidad 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 ELECTROROTATION 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 Viefhues
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

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Modeling/Numerical Simulation

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. Gill[1], Deema A. Masoudi[1], Sughan Narayanasamy[1], Patrick Hester[2], Pedro Estrela[1], and Nuno M. Reis[1]
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Nanofluidics/Nanofluidic Phenomena

M132.d **STRUCTURAL ANALYSIS OF WATER CONFINED IN NANOCHANNELS**
Kazuma Mawatari[1], Jun Shirai[1], Koji Ohara[2], Shinji Kohara[3], Toshio Yamaguchi[4], Koji Yoshida[4], and Takehiko Kitamori[1]
[1] *University of Tokyo, JAPAN,* [2] *Japan Synchrotron Radiation Research Institute, JAPAN,* [3] *National Institute for Materials Science, JAPAN, and* [4] *Fukuoka University, JAPAN*

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 NANOCHANEL 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-POROUS MEDIA**
Md Minhajul Islam and D. Jed Harrison
University of Alberta, CANADA

Nanofluidics/Nanofluidic Phenomena

W133.d THERMAL AND ELECTROKINETIC EFFECT ON DIFFUSIOOSMOSIS-DRIVEN IONIC TRANSPORT THROUGH NANOPORES
Jongwan Lee[1], Kyunghun Lee[1], Cong Wang[2], Dogyeong Ha[1], Jungyul Park[2], and Taesung Kim[1]
[1] *Ulsan National Institute of Science and Technology (UNIST), KOREA and* [2] *Sogang University, KOREA*

d - Fundamentals in Microfluidics and Nanofluidics

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. Byers[1], Anna R. Bird[1], Hyundae Cho[2], and Jacqueline C. Linnes[1]
[1] *Purdue University, USA and* [2] *Crosslife 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 HUMIDTY AND TEMPERATURE
Marta Orlowska[1], Bin Guan[1], Rossen Sedev[1,2], and Craig Priest[1]
[1] *University of South Australia, AUSTRALIA and*
[2] *Curtin 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*

Platforms Based on Capillary Forces

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 Charernchai[1], Miyuki Chikae[1], Wanida Wonsawat[2], Hirose Daisuke[1], Phan T. Tue[3], and Yuzuru Takamura[1]
[1] *Japan Advanced Institute of Science and Technology (JAIST), JAPAN,*
[2] *Suan Sunandha Rajabhat University, THAILAND, and*
[3] *Tokyo 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

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Others

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

Others

W138.d **INVESTIGATION ON VON WILLEBRAND FACTOR (VWF) PROTEOLYSIS BY ADAMTS13 ON-A-CHIP**
Amid Shakeri and Tohid F. Didar
McMaster University, CANADA

W139.d **SPATIOTEMPORALLY GENERATED MICROFLUIDS WITH THE AID OF HIGH-SPEED FLOW CONTROL**
Yusuke Kasai, Makoto Saito, Shinya Sakuma, and Fumihito Arai
Nagoya University, JAPAN

e - Micro- and Nanoengineering

Bonding, Sealing & Interfacing Technologies

M139.e **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

M140.e **HIGH-YIELD PARALLEL ASSEMBLY OF SINGLE SPHERE ON GEOMETRICALLY DESIGNED ADHESIVE POLYMER-POST**
Junghyun Bae, Seojoo Kim, and Wook Park
Kyung Hee University, KOREA

M141.e **POST-PROCESSING COMPATIBLE PACKAGING METHOD FOR CMOS OPTO-NANOFLUIDIC CHIP**
Jaehwan Kim, Huaiyu Meng, and Rajeev J. Ram
Massachusetts Institute of Technology, USA

T139.e **ENABLING COST-EFFECTIVE GLASS MICROFLUIDICS FOR LIFE SCIENCES: THE EXAMPLE OF A COMPLETE SEQUENCING DEVICE FABRICATED AT WAFER SCALE**
Sarah Heub[1], Rita Smajda[1], Guy Voirin[1], Gilles Weder[1], Anke Sanz-Velasco[2], Tobias Bauert[2], Alexios Tzannis[2], Raphaël Pugin[1], and Michel Despont[1]
[1] *CSEM, SWITZERLAND and* [2] *IMT AG, SWITZERLAND*

T140.e **INTEGRATION OF POROUS SILICON-BASED OPTICAL APTASENSORS IN A 3D-PRINTED MICROFLUIDIC PLATFORM FOR PROTEIN DETECTION**
Sofia Arshavsky-Graham[1,2], Niklas-Maximilian Epping[2], Anton Enders[2], Thomas Scheper[2], Janina Bahnemann[2], and Ester Segal[1]
[1] *Technion – Israel Institute of Technology, ISRAEL and*
[2] *Leibniz Universität Hannover, GERMANY*

T141.e **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

Bonding, Sealing & Interfacing Technologies

W140.e FABRICATION OF PMMA MICROFLUIDIC DEVICES INTEGRATED WITH POROUS PETE MEMBRANES FOR RELIABLE CYTOTOXICITY TESTS OF DRUGS
Thao Nguyen[1], Su Hyun Jung[1], Min Seok Lee[1], Tae-Eun Park[1], Suk-kyun Ahn[2], and Joo H. Kang[1]
[1] *Ulsan National Institute of Science and Technology (UNIST), KOREA and*
[2] *Pusan National University, KOREA*

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

e - Micro- and Nanoengineering

Micropumps, Valves, and Dispensers

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 Wang[1], Jian-Bo Chen[2], Sheng Ye[1], and Qun Fang[1]
[1] *Zhejiang University, CHINA and*
[2] *Hangzhou Jiejing Biotechnolgy 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 Bott[1], Franz Lärmer[1], Roland Zengerle[2], and Jochen Hoffmann[1]
[1] *Robert Bosch GmbH, GERMANY and* [2] *University of Freiburg, GERMANY*

W143.e MULTIFUNCTIONAL FEMTO-PIPETTE IN OPEN MICROFLUIDICS
Eleonoor Verlinden[1], Masoud Madadelahi[1,2], Edin Sarajlic[3], Amir Shamloo[2], Andreas H. Engel[1], Urs Staufer[1], and Murali K. Ghatkesar[1]
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[2] *Sharif University of Technology, IRAN, and*
[3] *SmartTip B.V., THE NETHERLANDS*

e - Micro- and Nanoengineering

Microscale Fabrication, Patterning, and Integration

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 Descamps[1], Samir Mekkaoui[1], Emmanuelle Laurenceau[1], Marie-Charlotte Audry[1], Jessica Garcia[2], Léa Payen[2], Damien Le Roy[3], and Anne-Laure Deman[1]
[1]*Lyon Institute of Nanotechnology, FRANCE,* [2]*Hospices Civils de Lyon, FRANCE, and* [3]*Institut 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 Nam[1], Chan Bae Jeong[1], Dong-Uk Kim[1], Youn-Mook Lim[2], and Ki Soo Chang[1]
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[2]*Korea 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. Teshima[1], Koji Sakai[1], Yoshiaki Kashimura[1], Hiroki Miyazako[1], Hiroshi Nakashima[1], Shingo Tsukada[1], Yuko Ueno[1], Toshihisa Osaki[2], and Shoji Takeuchi[2]
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M151.e **LOW-COST AND 3D-PRINTED HOLLOW MICRONEEDLE ARRAYS WITH COMPLEX DESIGNS FOR TRANSDERMAL DRUG DELIVERY APPLICATIONS**
Christopher Yeung, Haisong 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. Imamura[1,2], Julia Zakashansky[2], Emanuel Carrilho[1], and Michelle Khine[2]
[1]*University of São Paulo, BRAZIL and*
[2]*University of California, Irvine, USA*

M153.e **PDMS CURING INHIBITION BY 3D-PRINTED TEMPLATES. WHY? AND HOW TO AVOID IT?**
Bastien Venzac[1], Shanliang Deng[1,2], Shuhan Yang[1,2], Aufried Lenferink[1], Cees Otto[1], and Séverine Le Gac[1]
[1]*University of Twente, THE NETHERLANDS and*
[2]*Tianjing 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 Yu[1], Xiuyun Li[1], and Chunlei Guo[1,2]
[1]*Chinese Academy of Sciences, CHINA and* [2]*University 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 Kim[1], Byungjun Lee[2], Jihoon Ko[1], Youngtaek Kim[1], and Noo Li Jeon[1]
[1]*Seoul National University, KOREA and* [2]*Curiochips, 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

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T146.e **BIOINSPIRED MICROMECHANICAL INTERLOCKING STRUCTURES FOR ENHANCED ADHERENCE BETWEEN SOFT ELASTOMERIC LAYERS**

Navajit S. Baban[1,2], Ajymurat Orozaliev[1], Christopher. J. Stubbs[2], and Yong-Ak Song[1,3]
[1]*New York University, Abu Dhabi, UAE and* [2]*New 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 Bhardwaj[1], Phan T. Tue[2], Shinsuke Ishigaki[3], Hidetaka Uno[4], Zhi-Hong Wang[4], Yoshiaki Ukita[5], Sadahiro Iwabuchi[6], Shinichi Hashimoto[6], Takehiko Oka[7], Kozo Kawahara[7], Gen. Sobue[3], Tsuneo Urisu[4], Daisuke Hirose[1], and Yuzuru Takamura[1]
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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. Salva[1,2], Yuksel Temiz[1], Marco Rocca[2], Yulieth C. Arango[1], Christof M. Niemeyer[2], and Emmanuel Delamarche[1]
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[2]*Karlsruhe Institute of Technology, GERMANY*

T150.e **HIGH-VOLUME FABRICATION OF SYLGARD 184 DEVICES FOR SINGLE CELL ANALYTICS**

Christina Liedert[1], Benedek Poor[2], Olli-Heikki Huttunen[1], Johanna Hiitola-Keinänen[1], Sanna Aikio[1], Heli Pessa[2], Pinja Elomaa[2], Jussi Hiltunen[1], Päivi Saavalainen[2], and Leena Hakalahti[1]
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[2]*University of Helsinki, FINLAND*

T151.e **LOW-COST, LARGE-SCALE, CONTINUOUS PRODUCT OF GIANT MAGNETIC MICROPARTICLES, AND CUSTOMIZED FUNCTIONALIZATION**

Suk-Heung Song[1], Sujeong Lim[1], Hye Yeon Choi[2], Gyu Dong Kim[2], Joo Ho Kim[2], Yong-Gyun Jung[2], and Wook Park[1]
[1]*Kyung Hee University, KOREA and* [2]*Ezdiatech Inc., KOREA*

T152.e **PARTICLE MANIPULATION ON MAGNETIC GRID PATTERN**

Fujio Tsumori
Kyushu University, JAPAN

Microscale Fabrication, Patterning, and Integration

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, Zhaoqing 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 Hesse[1], Anja Haase[1], Dieter Nees[1], Stephan Ruttloff[1], Johannes Götz[1], Pelin Tören-Özgün[1], Markus Rumpler[1], Martin Smolka[1], Georgios Kokkinis[2], Günther Kriechhammer[2], Daniel Scheidl[2], Bianca Wilfing[2], Ingo Katzmayr[3], Max Sonnleitner[3], Mirko Lohse[4], and Manuel Thesen[4]
[1] *Joanneum Research FmbH, AUSTRIA,* [2] *Pessl Instruments GmbH, AUSTRIA,* [3] *GENSPEED Biotech GmbH, AUSTRIA, and* [4] *micro resist technology GmbH, GERMANY*

T155.e **SELF-PROPELLING MICRO SWIMMER WITH CONTROLLABLE MOTION**

Cheolheon Park[1], Yeongjae Choi[2], Hansol Choi[2], Seo Woo Song[2], Sunghoon Kwon[2], and Wook Park[1]
[1] *Kyung Hee University, KOREA and* [2] *Seoul National University, KOREA*

T156.e **THE DEVELOPMENT OF A MICROFLUIDIC BLOOD OXYGENATOR WITH FOUR-SIDED GAS TRANSFER CHANNELS**

Mohammadhossein Dabaghi[1], Neda Saraei[1], Gerhard Fusch[1], Niels Rochow[1], John L. Brash[1], Christoph Fusch[1,2], and P. Ravi Selvaganapathy[1]
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[2] *University 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 Aishan[1,2], Yaxiaer Yalikun[1], Satoshi Amaya[1], Yigang Shen[1,2], and Yo Tanaka[1,2]
[1] *Biosystems Dynamics Research (BDR), JAPAN and*
[2] *Osaka University, JAPAN*

W145.e **A SIMPLE AND ROBUST FABRICATION METHOD FOR CREATING 3D TAPERED POLYDIMETHYLSILOXANE CHANNELS**

Hoon Suk Rho[1], Henk-Willem Veltkamp[2], Danielle Baptista[1], Séverine Le Gac[1], and Pamela Habibović[1]
[1] *Maastricht University, THE NETHERLANDS and*
[2] *University of Twente, THE NETHERLANDS*

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W146.e APPLICATION OF 3D-PRINTED MICROFLUIDIC DEVICE AND MINIATURE PHOTODETECTION TECHNOLOGY TOWARDS PHOTOMETRY-BASED BIOCHEMICAL ANALSYSIS 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 Papamatthaiou, Pedro Estrela, and Despina Moschou
University of Bath, UK

Microscale Fabrication, Patterning, and Integration

W154.e PDMS MICROFLUIDIC DEVICES FABRICATION BY A CYCLIC BIOMACHINING PROCESS
Arrate Santaolalla[1], Yara Alvarez- Braña[1], Gorka Gallastegui[1], Lourdes Basabe-Desmonts[1,2], Naiara Rojo[1], and Fernando Benito-Lopez[1]
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[2] *Basque Foundation of Science, SPAIN*

W155.e SACRIFICIAL TEMPLATE REPLICATION-FABRIACTION OF SUSPENDED ARBITRARY THREE-DIMENSIONAL MICROCHANNELS IN FUSED SILICA GLASS
Frederik Kotz[1], Patrick Risch[1], Michael Thiel[2], Alexander Quick[2], Semih Sevim[3], Joseph Puigmarti-Luis[3], Dorothea Helmer[1], and Bastian E. Rapp[1]
[1] *University of Freiburg, GERMANY,* [2] *Nanoscribe GmbH, GERMANY and*
[3] *ETH Zürich, SWITZERLAND*

W156.e STIMULI-RESPONSIVE HYDROGEL INSTRUMENT BASED ON FRAME TRANSFORMATION (SHIFT) BY UTILIZING DEFOCUSING PHOTOLITHOGRAPHY TECHNIQUE
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 Estlack[1], Md Enayet Razu[2], Beau Compton[2], Zachary Duca[3], Amanda Stockton[3], Matin Golozar[4], Anna Butterworth[4], Jeremy McCauley[4], James New[5], Jungkyu Kim[1], and Richard A. Mathies[4]
[1] *University of Utah, USA,* [2] *Texas Tech University, USA,*
[3] *Georgia Tech, USA,* [4] *University of California, Berkeley, USA, and*
[5] *Univeristy of Kent, UK*

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M158.e FABRICATION AND EVALUATION OF FLEXIBLE NANOVALVES IN 2D- NANOCHANNELS
Hiroto Kawagishi[1], Shunichi Funano[2], Yo Tanaka[2], Shuichi Kawamata[1], and Yan Xu[1,3]
[1] *Osaka Prefecture University, JAPAN,* [2] *RIKEN, JAPAN, and*
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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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T158.e **HIGH-PERFORMANCE CERAMIC EOF PUMP REALIZED BY MASSIVELY PARALLEL SACRIFICIAL SILICON NANO-PILLAR MOULDING**
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 Liu[1], Jingquan Liu[2,3], and Wei Wang[1,2]
[1]*Peking University, CHINA,* [2]*National Key Laboratory of Science and Technology on Micro/Nano Fabrication, CHINA, and* [3]*Shanghai 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 Schlotter[1], Morteza Aramesh[1], Csaba Forró[1], Livie Drowling-Carter[1], Ines Lüchtefeld[1], Stephan J. Ihle[1], Ivan Shorubalko[2], Vahid Hosseini[1], Dmitry Momotenko[1], Tomaso Zambelli[1], Enrico Klotzsch[1,3], and Janos Vörös[1]
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Novel, Smart, and Responsive Materials

M161.e **FABRICATION AND CHARACTERIZATION OF FLEXDYM–POLYCARBONATE DEVICES: IMPLEMENTING NEW MATERIALS FOR ORGAN-ON-CHIP TECHNOLOGIES**
Alexander H. McMillan[1,2], Emma K. Thomée[1,3], Alessandra Dellaquila[1,4], and Sasha Cai Lesher-Pérez[1]
[1]*Elvesys Microfluidic Innovation Center, FRANCE,* [2]*KU Leuven, BELGIUM,* [3]*University of Strasbourg, FRANCE, and* [4]*University of Bielefeld, GERMANY*

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

Novel, Smart, and Responsive Materials

T161.e **NANOZYME-AMPLIFIED LATERAL FLOW IMMUNOASSAY FOR MOLECULAR SIGNATURE DETECTION OF CARDIOVASCULAR DISEASES**

Marta Broto[1], Brian Chen[1], Michael R. Thomas[1], Chris S. Wood[1], Amrit S. Lota[2], Sanjay Prasad[2], and Molly M. Stevens[1]
[1]*Imperial College London, UK and* [2]*Royal 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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Surface Modification

M162.e **ANALYZING PEPTIDE ADSORPTION STATES VIA NANOWIRE-EMPLOYED INFRARED SPECTROMETRY**

Hiroki Naito[1], Takao Yasui[1], Taisuke Shimada[1], Nobutaka Shioya[2], Takafumi Shimoaka[2], Masayoshi Tanaka[3], Kazuki Nagasima[4], Mina Okochi[3], Takeshi Yanagida[4,5], Takeshi Hasegawa[2], and Yoshinobu Baba[1,6]
[1]*Nagoya University, JAPAN,* [2]*Kyoto University, JAPAN,* [3]*Tokyo Institute of Technology, JAPAN,* [4]*Kyushu University, JAPAN,* [5]*Osaka University, JAPAN, and* [6]*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*

M163.e **NANOFORESTS GROWN ON MICROPILLARS FOR CARBONYL COMPOUNDS PRECONCENTRATION AND SERS DETECTION**

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 TiO_2 MICRO-SPIKES AND MICRO-FLOWERS FOR MASSIVELY PARALLEL INTRACELLULAR DELIVERY**

Loganathan Mohan[1], Srabani Kar[2], Balasubramaniam Nandhini[1], Pallavi Gupta[1], Pallavi Shinde[1], Pallab Sinha Mahapatra[1], and Tuhin Subhra Santra[1]
[1]*Indian Institute of Technology, Madras (IITM), INDIA and* [2]*University of Cambridge, London, UK*

T163.e **STRETCHABLE AND TRANSPARENT SUPERHYDROPHOBIC AND OLEOPHOBIC PDMS THIN FILM WITH HIERARCHICAL STRUCTURES**

Chaerin Yu[1], Eungjun Lee[2], Do Hyun Kim[2], and Dong-Weon Lee[1]
[1]*Chonnam National University, KOREA and*
[2]*Korea Advanced Institute of Science and Technology (KAIST), KOREA*

Surface Modification

W162.e **ADDITIVE SURFACE MODIFICATION BY POLYMER THIN FILM FORMATION USING ELECTROSPRAY DEPOSITION APPARATUS WITH A TERNARY ELECTRODE**
Yuta Kuwahata[1], Hiroaki Takehara[1,2], and Takanori Ichiki[1,2]
[1]*University of Tokyo, JAPAN and* [2]*Innovation Center of NanoMedicine (iCONM), JAPAN*

W163.e **MASKLESS SURFACE PATTERNING BY PLASMA POLYMERIZATION FOR MULTIBIOSENSING APPLICATIONS**
Laura Barillas[1], Ekaterina Makhneva[1], Ihsan Amin[1], Klaus-Dieter Weltmann[1], Hermann Seitz[2], and Katja Fricke[1]
[1]*Leibniz Institute for Plasma Science and Technology (INP), GERMANY and* [2]*University of Rostock, GERMANY*

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Others

M164.e **PRODUCING PERIODIC SEQUENTIAL FLOW BY GRAVITY-DRIVEN MICROFLUIDIC ACTUATORS**
Zhenglin Li and Sung-Jin Kim
Konkuk University, KOREA

T164.e **SURFACE TENSION DRIVEN SWARM ROBOTS FOR EMERGING COORDINATING MOTIONS**
Koki Yoshida, Tomoki Hayashi, and Hiroaki Onoe
Keio University, JAPAN

W164.e **BUBBLE-ASSISTED MICRO / NANOFLUIDICS: DEMONSTRATION OF BUBBLE GENRATION AND VALVE FUNCTION**
Shun Furukawa, Kazuma Mawatari, and Takehiko Kitamori
University of Tokyo, JAPAN

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Biosensors

M165.f **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

M166.f **AN "ENZYME-RESPONSIVE IONIC LIQUID" TOWARD CAPILLARY ARRAY-BASED IMMUNOASSAY MICRODEVICES**
Ryoutarou Oishi, Tatsumi Mizuta, Kenji Sueyoshi, Tatsuro Endo, and Hideaki Hisamoto
Osaka Prefecture University, JAPAN

M167.f **ANALYTE CAPTURE IN AN ARRAY OF FUNCTIONALIZED DROPLETS FOR A REGENERABLE BIOSENSOR**
Charles-Louis Azzopardi, Franck Chollet, Jean-François Manceau, and Wilfrid Boireau
Unviersity Bourgogne Franche-Comté, FRANCE

Biosensors

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 Arima[1], Makusu Tsutsui[2], Yoshida Takeshi[2], Kazumichi Yokota[2], Wataru Tonomura[2], Takao Yasui[1], Taisuke Shimada[1], Tomoko Yamazaki[2], Kenji Tatematsu[2], Shun'ichi Kuroda[2], Masateru Taniguchi[2], Takashi Washio[2], Tomoji Kawai[2], and Yoshinobu Baba[1]
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M173.f **INKJET-PRINTED SINGLE-STEP COMPETITIVE IMMUNOASSAY MICRODEVICE FOR THE DETECTION OF CRP**
Yuko Kawai[1], Masaya Kakuta[2], Kenji Sueyoshi[1], Tatsuro Endo[1], and Hideaki Hisamoto[1]
[1]*Osaka Prefecture University, JAPAN and* [2]*Sysmex Corporation, JAPAN*

M174.f **MULTIPLEXED DETECTION OF PLANT HEALTH BIOMARKERS**
Eduardo J.S. Brás[1,2], Ana M. Fortes[2], Virginia Chu[1], Pedro Fernandes[2], and João P. Conde[1,2]
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M175.f **PRIMARY HAEMOSTASIS ASSESMENT BY REAL-TIME DIRECT SENSING OF PLATELET-COLLAGEN INTERACTIONS UNDER DYNAMICS IN A BROAD SHEAR RATE SPECTRUM WITH MICROACOUSTIC BIOSENSOR APPROACH**

Aleksandr Oseev[1], Fabien Remy-Martin[1], Thomas Lecompte[2], Alain Rouleau[1], Guillaume Mourey[1,3,4], Jean-François Manceau[1], Céline Élie-Caille[1], Wilfrid Boireau[1], Emmanuel de Maistre[5], and Thérèse Leblois[1]

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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[1], Akiko Hosoyama[2], Kenichiro Morisawa[2], Yasuhiko Taira[2], and Hiroyuki Kudo[1]

[1] *Meiji University, JAPAN and*

[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

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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 Yousefi[1], Sahar E. Samani[2], Akansha Prasad[2], Amid Shakeri[2], Hsuan-Ming Su[2], Carlos D.M. Filipe[2], and Tohid F. Didar[2]
[1]*University of Toronto, CANADA and* [2]*McMaster University, CANADA*

T170.f **ELECTRICAL DETECTION OF THE MECHANICAL ALTERATION OF SICKLING RED BLOOD CELLS WITHIN A MICROFLUIDIC CAPILLARY NETWORK**
Xu Tieying[1], Maria Lizarralde[2], Jean Roman[1], Wassim El Nemer[2], Bruno Le Pioufle[1], and Olivier Français[1,3]
[1]*ENS Paris-Saclay, FRANCE,* [2]*INTS, FRANCE and* [3]*ESYCOM, FRANCE*

T171.f **FLEXIBLE MICROFLUIDIC NETWORKS ENABLING RAPID PROTOTYPING OF NOVEL SURFACE CHEMISTRIES IN LAB-ON-CHIP**
Francesca Costantini[1], Lorenzo Iannascoli[1], Nicola Lovecchio[1], Mara Mirasoli[2], Giampiero de Cesare[1], Domenico Caputo[1], and Augusto Nascetti[1]
[1]*Sapienza University of Rome, ITALY and* [2]*University of Bologna, ITALY*

T172.f **IMMUNOASSAYS BASED ON HOT ELECTRON INDUCED ELECTROCHEMILUMINESCENSE ON DISPOSABLE CELL CHIPS WITH PRINTED ELECTRODES**
Nur-E-Habiba[1,2], Kalle Salminen[2], Päivi Grönroos[2], Esko Kauppinen[1], Veikko Sariola[1], and Sakari Kulmala[2]
[1]*Tampere University, FINLAND and* [2]*Aalto University, FINLAND*

T173.f **ISOTHERMAL NANOPORE DNA SENSING USING DIFFUSION CURRENT**
Wei-Lun Hsu[1], Soumyadeep Paul[1], Zhen Gu[2], Ya-Lun Ho[1], Jean-Jacques Delaunay[1], Yi-Lun Ying[2], Yi-Tao Long[2,3], and Hirofumi Daiguji[1]
[1]*University of Tokyo, JAPAN,* [2]*East China University of Science and Technology, CHINA, and* [3]*Nanjing 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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T175.f **QUANTUM-LIMITED 2D SENSORS FOR PH AND BIOSENSING**
Arvind Balijepalli[1], Son T. Le[1,2], Harish C. Pant[3], and Curt A. Richter[1]
[1] *National Institute of Standards and Technology (NIST), USA,*
[2] *Theiss Research, USA, and* [3] *National 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 Chiadò, 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 Chu[1], Chih-Yu Chen[1], and Min-Hsien Wu[1,2]
[1] *Chang Gung University, TAIWAN and*
[2] *Chang 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 Hao[1,2], Manohar Prasad Koduri[1,2], Fan Gang Tseng[1,3], James Henstock[2], John A. Hunt[2,4], and Judy Curran[2]
[1] *National Tsing Hua University, TAIWAN,* [2] *University of Liverpool, UK,*
[3] *Academia Sinica, TAIWAN, and* [4] *Nottingham Trent University, UK*

W167.f **AN INTEGRATED CAPILLARY-DRIVEN IMPEDIMETRIC BIOSENSOR FOR MICROPARTICLE-LABELED IMMUNOASSAY**
Ali Khodayari Bavil[1], Drago Sticker[2], Peter Ertl[2], and Jungkyu Kim[3]
[1] *Texas Tech University, USA,* [2] *Vienna University of Technology, AUSTRIA, and* [3] *University of Utah, USA*

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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-Hernando[1], Alba Calatayud-Sanchez[1], Jaione Etxebarria-Elezgarai[1], Marian M. de Pancorbo[1], Fernando Benito-Lopez[1], and Lourdes Basabe-Desmonts[1,2]
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[2]*Basque 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 Sarioglu
Georgia Institute of Technology, USA

W171.f ENHANCED RAMAN AND FLUORESCENCE SIGNALS BY HIGH-ASPECT-RATIO NANOCORRUGATED PARTICLES FOR LIQUID-BIOPSY MIRNA DETECTION
Kuan-Hung Chen[1], Meng-Ju Pan[1], and Fan-Gang Tseng[1,2]
[1]*National Tsing Hua University, TAIWAN and* [2]*Academia Sinica, TAIWAN*

W172.f HIGH-PERFORMANCE BIOELECTRONIC NOSE BASED ON OLFACTORY RECEPTOR-INCORPORATED NANODISC FOR THE DETECTION OF DEATH-ASSOCIATED ODOR
Hyun Seok Song[1], Heehong Yang[2], Jungkyun Oh[2], Jyongsik Janf[2], and Tai Hyun Park[2]
[1]*Korea Institute of Science and Technology (KIST), KOREA and*
[2]*Seoul National University, KOREA*

W173.f INTEGRATED MICROFLUIDIC DEVICE FOR UNIVERSAL SECRETORY IMMUNOPHENOTYPING STUDIES FOR ADHERENT AND NON-ADHERENT CELLS
Roberto Rodriguez-Moncayo, Rocio J. Jimenez-Valdes, Alan M. Gonzalez-Suarez, and Jose L. Garcia-Cordero
Centro de Investigación y de Estudios Avanzados del IPN, MEXICO

W174.f LAB-ON-A-CHIP BASED ELECTROCHEMICAL DETECTION OF FERRITIN
Mayank Garg[1,2,3], Martin G. Christensen[3], Alexender Iles[3], Amit L. Sharma[1,2], Nicole Pamme[3], and Suman Singh[1,2]
[1]*Academy of Scientific and Innovative Research, INDIA,*
[2]*Central Scientific Instruments Organization, INDIA, and*
[3]*University of Hull, UK*

W175.f PRECIPITATION-BASED ENZYMATIC SIGNAL AMPLIFICATION IN HYDROGELS
Nidhi Juthani and Patrick S. Doyle
Massachusetts Institute of Technology, USA

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W176.f **REAL-TIME PROCESSING OF CODE-MULTIPLEXED COULTER SIGNALS BASED ON A TWO-STAGE DEEP LEARNING STRUCTURE**
Ningquan Wang, Ruxiu Liu, Norh Asmare, and A. Fatih Sarioglu
Georgia Institute of Technology, USA

W177.f **DEVELOPMENT OF IN-AIR EIS SENSOR ENABLING TO DISTINGUISH IMPEDANCE OF CELL POPULATION AND TIGHT-JUNCTION FORMATION AT AIR-LIQUID INTERFACE**
Seungbeom Noh and Hanseup Kim
University of Utah, USA

W178.f **SURFACE PLASMON RESONANCE IMAGING ENHANCED BY DIELECTROPHORESIS AND AC ELECTROOSMOSIS**
Marion Costella[1,3], Marie Frénéa-Robin[1], Julien Marchalot[1], Julien Moreau[2], Oleh Andreiev[1,3], Paul Charette[3], and Michael Canva[3]
[1]*Université Lyon, FRANCE,* [2]*CNRS, FRANCE, and* [3]*Université de Sherbrooke, CANADA*

W179.f **ULTRASENSITIVE MIRNA DETECTION USING TARGET CYCLING AMPLIFICATION AND DIGITAL MICROFLUIDICS**
Bin Wang, Zhang You and Dahai Ren
Tsinghua University, CHINA

W180.f **VERTICALLY SHEATHING LAMINAR FLOW-BASED IMMUNOASSAY USING SIMULTANEOUS DIFFUSION-DRIVEN IMMUNE REACTIONS**
Amanzhol Kurmashev[1], Seyong Kwon[1], Je-Kyun Park[2], and Joo H. Kang[1]
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M180.f **A DUAL-GATE ALGAN/GAN HEMT BASED PH SENSOR WITH TUNABLE SENSITIVITY**
Qi Cheng, Maojun Wang, Ming Tao, Ruiyuan Yin, Yue Li, Nana Yang, Chengchen Gao, Yilong Hao, Wenhua Xu, and Zhenchuan Yang
Peking University, CHINA

M181.f **AN ULTRASENSITIVE SENSOR AND ANALYTICAL FRAMEWORK FOR WEARABLE AND MULTIPLEXED DRUG MONITORING APPLICATIONS**
Shuyu Lin, Bo Wang, Wenzhuo Yu, and Sam Emaminejad
University of California, Los Angeles, USA

M182.f **"CALCIUM-RESPONSIVE IONIC LIQUID" FOR NAKED EYE-BASED MULTIPLEXED ION DETECTION ON A PDMS MICROCHANNEL ARRAY DEVICE**
Tatsumi Mizuta, Yusuke Niwa, Kenji Sueyoshi, Tatsuro Endo, and Hideaki Hisamoto
Osaka Prefecture University, JAPAN

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M183.f **LIGHT THERAPY DEVICE WITH TRANSEPIDERMAL POTENTIAL-BASED REAL-TIME MONITORING OF SKIN BARRIER RECOVERY**
Hajime Konno, Yuina Abe, Shotaro Yoshida, and Matsuhiko Nishizawa
Tohoku University, JAPAN

M184.f **REDUCED GRAPHENE OXIDE-MODIFIED MICROELECTRODE FOR ANTIPSYCHOTIC CLOZAPINE DETECTION IN FINGER-PRICKED BLOOD**
Rajendra P. Shukla[1], Remi Cezelles[1], Deanna L. Kelly[2], and Hadar Ben-Yoav[1]
[1]*Ben-Gurion University, ISRAEL and*
[2]*University of Maryland School of Medicine, USA*

M185.f **VOLATILE ODORANT DETECTION BY OLFACTORY RECEPTORS FORMED IN A LIPID BILAYER MEMBRANE**
Tetsuya Yamada[1], Koki Kamiya[1], Toshihisa Osaki[1], and Shoji Takeuchi[1,2]
[1]*Kanagawa Institute of Industrial Science and Technology, JAPAN and*
[2]*University of Tokyo, JAPAN*

T180.f **A DROPLET MICROFLUIDIC-BASED SENSOR FOR MONITORING RIVER NITRATE/NITRITE CONCENTRATIONS**
Adrian M. Nightingale[1], Sammer-ul Hassan[1], Brett M. Warren[2], Kyriacos Makris[2], Gareth W.H. Evans[1], Evanthia Papadopoulou[2], Sharon Coleman[1,2], and Xize Niu[1,2]
[1]*University of Southampton, UK and* [2]*SouthWestSensor Ltd, UK*

T181.f **AN ULTRA-LOW POWER HIGHLY-SENSITIVE VAPOR SENSOR BASED ON QUANTUM TUNNELING**
Aishwaryadev Banerjee, Rugved Likhite, Hanseup Kim, and Carlos Mastrangelo
University of Utah, USA

T182.f **DETECTION OF SWELL/SHRINK BEHAVIOR OF STIMULI-RESPONSIVE HYDROGEL BY SINGLE WALLED CARBON NANOTUBE STRAIN SENSOR**
Erika Iyama[1], Daisuke Kiriya[2], and Hiroaki Onoe[1]
[1]*Keio University, JAPAN and* [2]*Osaka Prefecture University, JAPAN*

T183.f **MICROFLUIDIC PARTICLE DAM FOR VISUAL AND QUANTITATIVE DETECTION OF LEAD IONS**
Gaobo Wang, Lok Ting Chu, Hogi Hartanto, William B. Utomo, Reynard Aaron Pravasta, and Ting-hsuan Chen
City University of Hong Kong, HONG KONG

T184.f **RAPID ON-SITE DETERMINATION OF TOTAL NITROGEN IN WATER USING A PORTABLE ANALYTICAL SYSTEM**
Chen Zhao[1,3], Longyan Chen[2], Guowei Zhong[2], Qiyang Wu[1,2], Jinxia Liu[2], and Xinyu Liu[1]
[1]*University of Toronto, CANADA,* [2]*McGill University, CANADA, and*
[3]*University of Pennsylvania, USA*

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W181.f AN ELECTROENZYMATIC SENSOR WITH ENHANCED SENSITIVITY AND SELECTIVITY FOR WEARABLE NUTRIENT MONITORING APPLICATIONS
Xuanbing Cheng, Bo Wang, Yichao Zhao, and Sam Emaminejad
University of California, Los Angeles, USA

W182.f ANALYTICAL MICROSYSTEM FOR THE POTASSIUM MONITORING IN WINE MAKING PROCESSES
Antonio Calvo-López, Ernest Martinez-Bassedas, Mar Puyol, and Julian Alonso-Chamarro
Autonomous University of Barcelona, SPAIN

W183.f INELASTIC TUNNELING SPECTROSCOPY MICROMACHINED GAS SENSOR FOR ENVIRONMENTAL APPLICATIONS
Aishwaryadev Banerjee, Rugved Likhite, Hanseup Kim, and Carlos H. Mastrangelo
University of Utah, USA

W184.f MICROFLUIDICS UNDER THE SEA: A LAB-ON-CHIP SENSOR FOR *IN-SITU* MEASUREMENTS OF OCEAN ALKALINITY
Allison Schaap, Stathys Papadimitriou, Edward Mawji, Socratis Loucaides, and Matthew Mowlem
National Oceanography Centre, UK

W185.f THREE DIMENSIONAL CARBON MULTIELECTRODE ARRAYS FOR ELECTROCHEMICAL DETECTION OF DOPAMINE IN LOW CONCENTRATIONS
Joonas J. Heikkinen, Noora Isoaho, Ville Jokinen, and Sami Franssila
Aalto University, FINLAND

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M186.f ABSORBANCE SPECTRA-ACTIVATED DROPLET SORTING FOR HIGH-THROUGHPUT LABEL-FREE CHEMICAL IDENTIFICATION
Todd A. Duncombe[1], Aaron Ponti[1], Alice Maurer[2], Florian Seebeck[2], and Petra S. Dittrich[1]
[1]*ETH Zürich, SWITZERLAND and* [2]*University of Basel, SWITZERLAND*

M187.f IMPEDANCE SPECTROSCOPY AND OPTICAL IMAGING FOR AUTOMATED MULTIMODAL PALYNOLOGY
Riccardo Reale[1], Adele De Ninno[1,2], Maria A. Brighetti[1], Luca Businaro[2], Alessandro Travaglini[1], Paolo Bisegna[1], and Federica Caselli[1]
[1]*University of Rome Tor Vergata, ITALY and*
[2]*CNR Institute for Photonics and Nanotechnologies, ITALY*

M188.f IMPEDANCE-BASED QUANTIFICATION OF PARASITIC VOLTAGE DROPS FOR OPTIMIZING AC ELECTROKINETIC TRAPPING
Vahid Farmehini[1], Walter Varhue[1], Armita Salahi[1], Jaka Camazar[2], Alexandra Hyler[2], Rafael Davalos[2], and Nathan Swami[1]
[1]*University of Virginia, USA and* [2]*Virginia Tech, USA*

Label-free Detection

M189.f **SERS DETECTION OF Aß40 AND ZN2+-Aß40 PEPTIDES ON AN ELECTRODE NANOGAP ENABLED PLATFORM**
Katrin H.P. Vu[1,2], Ming-Che Lee[2,3], Gerhard H. Blankenburg[2,4], Yun-Ru Chen[2,3], Ming-Lee Chu[2], Andreas Erbe[5], Leonardo Lesser-Rojas[6,7], and Chia-Fu Chou[2]
[1]*National Tsing Hua University, GERMANY,* [2]*Academia Sinica, TAIWAN,* [3]*National Defense Medical Center, TAIWAN,* [4]*National Taiwan University, TAIWAN,* [5]*Norwegian University of Science and Technology, NORWAY,* [6]*Centro de Investigación en Ciencias Atómicas, COSTA RICA, and* [7]*University of Costa Rica, COSTA RICA*

T185.f **A HIGH THROUGHPUT ELECTRONIC CELL ANALYZER FOR CELL MECHANOPHENOTYPING**
Norh Asmare, A K M Arifuzzman, Ningquan Wang, Mert Boya, Rixiu Liu, and A. Fatih Sarioglu
Georgia Institute of Technology, USA

T186.f **DIELECTROPHORETIC DETECTION OF IMATINIB RESISTANCE IN K562 CELLS USING A LAB-ON-A-CHIP SYSTEM**
Yağmur Demircan Yalçin[1,2], Taylan Berkin Töral[2], Sertan Sukas[2], Ender Yıldırım[2,4], Özge Zorlu[2], Ufuk Gündüz[1], and Haluk Külah[1]
[1]*Middle East Technical University, TURKEY,* [2]*Mikro Biyosistemler Electronics Inc., TURKEY,* [3]*METU MEMS Center, TURKEY, and* [4]*Çankaya University, TURKEY*

T187.f **LABEL-FREE ELECTRICAL IMPEDANCE SPECTROSCOPY BASED SENSOR-IN-A-TUBE FOR SINGLE CELLS ANALYSIS**
Aleksandr Egunov[1], Mariana Medina-Sánchez[1], Dmitriy D. Karnaushenko[1], Nicole Kretschmann[2], Katja Akgün[2], Tjalf Ziemssen[2], Daniil Karnaushenko[1], and Oliver G. Schmidt[1,3]
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T188.f **NON-INVASIVE DETECTION OF NEPHROTOXICITY ON A PROXIMAL TUBULE ON-A-CHIP BY TRANS-EPITHELIAL/TRANS-ENDOTHELIAL ELECTRICAL RESISTANCE MEASUREMENTS**
Ryohei Ueno[1], Ramin B. Sadeghian[1], Yuji Takata[1], Kiyotaka Tsuji[2], and Ryuji Yokokawa[1]
[1]*Kyoto University, JAPAN and* [2]*Panasonic Corporation, JAPAN*

T189.f **TOWARDS REAL-TIME MULTIPARAMETRIC IMPEDANCE CYTOMETRY**
John McGrath[1], Riccardo Reale[2], Carlos Honrado[1], Paolo Bisegna[2], Nathan Swami[1], and Federica Caselli[2]
[1]*University of Virginia, USA and* [2]*University of Rome Tor Vergata, ITALY*

W186.f **DETECTION OF STEROID HORMONES VIA DIRECT QUENCHING OF QUANTUM DOTS**
Ye Liu, Bo Wu, Yi-Chieh Wang, and Li-Jing Larry Cheng
Oregon State University, USA

Label-free Detection

W187.f FAST REACTION SCREENING COMBINING SEGMENTED FLOW MICROFLUIDICS AND SURFACE ENHANCED RAMAN SPECTROSCOPY
Alexander Mendl[1], Michael Köhler[2], and Dušan Boskovic[1]
[1]*Fraunhofer ICT, GERMANY and* [2]*TU Ilmenau, GERMANY*

W188.f LABEL-FREE NANOPARTICLE DETECTION IN 10^2 nm CHANNEL BY UTILIZING PHOTOTHERMAL OPTICAL DIFFRACTION
Yoshiyuki Tsuyama and Kazuma Mawatari
University of Tokyo, JAPAN

W189.f SEPARATION OF MITOCHONDRIAL DISEASED CELLS BASED ON ORGANELLE-LEVEL DIFFERENCE USING A DEP MICROFLUIDIC SYSTEM
Pei-Yin Chi[1,2], Ting-Wei Chuang[1], Tzu-Tsai Chu[1], Chia-Tzu Kuo[1], Yu-Ting Wu[2], Vahid Farmehini[4], Dar-Bin Shieh[5], Fan-Gang Tseng[2], Yau-Huei Wei[3], Nathan Swami[4], and Chia-Fu Chou[1]
[1]*Academia Sinica, TAIWAN,* [2]*National Tsing Hua University, TAIWAN,* [3]*Changhua Christian Hospital, TAIWAN,* [4]*University of Virginia, USA, and* [5]*National Cheng-Kung University, TAIWAN*

W190.f SINGLE-CELL MICROSCOPIC RAMAN SPECTROSCOPY FOR RAPID MICROBIAL DETECTION
Daisuke Onoshima, Kentaro Uchida, Hiroshi Yukawa, Kenji Ishikawa, Masaru Hori, and Yoshinobu Baba
Nagoya University, JAPAN

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M190.f OPTOFLUIDIC CYTOMETRY FOR BACTERIA DETECTION
Shilun Feng[1], Patricia Y. Liu[1], Jingbo Zhang[1], Jiaqing Yu[1], Fangyuan Sun[1], Zhenyu Li[1,2], Yi Zhang[1], Nguyen K. Truc[1], Yap P.H. Eric[1], Wee Ser[1], and Aiqun Liu[1]
[1]*Nanyang Technological University, SINGAPORE and* [2]*Peking University, BEIJING*

M191.f A NEW MICROFLUIDIC MONITORING METHOD USING INFRARED SENSOR UNIT
Thinh H. Nguyen[1], Alex Milleman[1], Sthitodhi Ghosh[1], Vinitha TU[1], Bon-Ki Ku[2],and Chong H. Ahn[1]
[1]*University of Cincinnati, USA and* [2]*CDC-NIOSH, USA*

M192.f DEVELOPMENT OF A HIGH SPATIO-TEMPORAL RESOLUTION ELECTROCHEMICAL IMAGING SYSTEM USING A CLOSED BIPOLAR ELECTRODE ARRAY
Tomoki Iwama, Kumi Y. Inoue, Hiroya Abe, Tomokazu Matuse, and Hitoshi Shiku
Tohoku University, JAPAN

M193.f HIGH-THROUGHPUT OPTOFLUIDIC 3D CELL IMAGING
Masashi Ugawa[1,2] and Sadao Ota[1]
[1]*University of Tokyo, JAPAN and* [2]*RIKEN, JAPAN*

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M194.f **LENSFREE EARLY DETECTION OF BACTERIAL COLONIES**
Vincent Haguet[1], Dorothée Balle[1], and Gaëlle Saint-Auret[2]
[1] *CEA Grenoble, FRANCE and* [2] *GENEL SAS, FRANCE*

M195.f **OPEN SOURCE LAB AUTOMATION FOR HIGH THROUGHPUT MICROFLUIDIC MICROBIOLOGY**
Sarah H. Needs and Alexander D Edwards
University of Reading, UK

M196.f **OPTICAL INJECTION OF FLUORESCENCE MICROSENSOR TO A SPECIFIC CELL BY OPTICAL TWEEZERS AND LOCAL HEATING**
Hisataka Maruyama, Ryo Yanagawa, and Fumihito Arai
Nagoya University, JAPAN

M197.f **PHOTOTHERMAL DETECTION PROBE USING OPTICAL FIBER**
Hisashi Shimizu and Shoji Takeuchi
University of Tokyo, JAPAN

M198.f **PORTABLE FLUORESCENCE POLARIZATION ANALYZER FOR ON-SITE MULTISAMPLE IMMUNOASSAY**
Ayano Nakamura[1], Osamu Wakao[1], Ken Satou[2], Mitsutoshi Aoyagi[3], Kazuhiko Nishimura[3], Chikaaki Mizokuchi[2], Ken Sumiyoshi[2], Masatoshi Maeki[1], Akihiko Ishida[1], Hirofumi Tani[1], Koji Shigemura[2], Akihide Hibara[4], and Manabu Tokeshi[1]
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M199.f **ULTRA-SMALL FOUR-EMISSION-POINT SPECTRAL-DETECTION SYSTEM BY SEVEN-DICHROIC-MIRROR ARRAY**
Takashi Anazawa[1] and Motohiro Yamazaki[2]
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[2] *Hitachi High-Technologies Corporation, JAPAN*

T190.f **A DEEP LEARNING ENABLED FIELD-PORTABLE CELL ANALYZER**
Dongmin Seo[1], Sanghoon Shin[1], Haechang Yang[1], Seungmin Myeong[1], Euijin Han[1], Sangwoo Oh[2], Moonjin Lee[2], and Sungkyu Seo[1]
[1] *Korea University, KOREA and*
[2] *Korea Research Institute of Ships & Ocean Engineering, KOREA*

T191.f **CONTINUOUS GLUCOSE MONITORING INSIDE SPHEROIDS BY MESOPOROUS FLUORESCENT MICROPARTICLES**
Jun Sawayama and Shoji Takeuchi
University of Tokyo, JAPAN

T192.f **HEAVY METALS MICROANALYSER FOR WATER QUALITY MONITORING BASED ON SELECTIVE CARBON DOTS FLUORESCENCE QUENCHING**
Alex Pascual-Escó, Miguel Berenguel-Alonso, Julián Alonso-Chamarro, and Mar Puyol
Universitat Autònoma de Barcelona, SPAIN

Optical Detection & Imaging

T193.f ***IN-SITU*** **MONITORING OF ESCHERICHIA COLI GROWTH ON DIGITAL MICROFLUIDICS BY OPTICAL CHEMOSENSORS FOR MICROBIAL CELL METABOLISM STUDIES**
Wenting Qiu and Stefan Nagl
Hong Kong University of Science and Technology, HONG KONG

T194.f **LAB-ON-A-CD CAPABLE OF CONTINUOUS FLUORESCENCE MEASUREMENT**
Kazuhiro Morioka[1], Takuya Nojo[2], Akihide Hemmi[3], Norio Teshima[4], Tomonari Umemura[1], Shungo Kato[2], Katsumi Uchiyama[2], and Hizuru Nakajima[2]
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[2] *Tokyo Metropolitan University, JAPAN,*
[3] *Mebius Advanced Technology Ltd., JAPAN, and*
[4] *Aichi Institute of Technology, JAPAN*

T195.f **NANOLITRE-SCALE CAPILLARY CELL WITH EXTENDED EFFECTIVE OPTICAL PATH AND REDUCED STRAY LIGHT FOR ABSORPTION PHOTOMETRIC DETECTION**
Jozef Šesták, Josef Planeta, and Vladislav Kahle
Czech Academy of Sciences, CZECH REPUBLIC

T196.f **PEROVSKITE NANOCRYSTAL – HYFLON AD 60 OPTICAL THERMAL SENSORS FOR TEMPERATURE IMAGING IN DIGITAL MICROFLUIDICS**
Zhangdi Lu[1], Yanxiu Li[2], Wenting Qiu[1], Andrey L. Rogach[2], and Stefan Nagl[1]
[1] *Hong Kong University of Science and Technology, HONG KONG and*
[2] *City University of Hong Kong, HONG KONG*

T197.f **PLASMON-BASED DETECTION OF TOXICITY BIOMARKERS DERIVED FROM MICROPLASTICS-TREATED MODEL ANIMALS**
Seungki Lee, Tae Ho Kang, Jinhee Choi, and Inhee Choi
University of Seoul, KOREA

T198.f **SPATIALLY HOMOGENEOUS ILLUMINATION BY A COMPACT OPTICAL ARCHITECTURE**
Vincent Haguet and Bernard Sartor
CEA Grenoble, FRANCE

W191.f **A MICROFLUIDIC CHIP WITH AN INTEGRATED MICRO-HEATER AND LUMINESCENT TEMPERATURE SENSOR FOR SPATIALLY RESOLVED ANALYSIS OF DNA MELTING CURVES**
Xuyan Lin, Chenyu Cui, and Stefan Nagl
Hong Kong University of Science and Technology, HONG KONG

W192.f **COLLOIDAL PHOTONIC CRYSTAL ARRAY CHIP BASED ON NANOPARTICLE SELF-ASSEMBLY ON PATTERNED HYDROPHOBIC SURFACE FOR SIGNAL-ENHANCED FLUORESCENT ASSAY**
Rui Guo, Dan-Ni Wang, Yun-Yun Wei, Ying-Zhi Zhang, Chun-Guang Yang, and Zhang-Run Xu
Northeastern University, CHINA

Optical Detection & Imaging

W193.f HIGH THROUGHPUT SIZE-DETERMINATION AND MULTIPLEXED FLUORESCENCE ANALYSIS OF SINGLE BIOLOGICAL PARTICLES IN A NANOFLUIDIC DEVICE
Quenting Lubart[1], Sune Levin[1], Stephan Block[2], Silver Jõemetsa[1], Sriram KK[1], Fredrik Höök[1], Marta Bally[3], Elin K. Esbjörner[1], and Fredrik Westerlund[1]
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[2] *Freie Universität Berlin, GERMANY, and*
[3] *Umeå University, SWEDEN*

W194.f INTEGRATED GLASS MICROPRISMS' MATRIX FOR LIGHT COUPLING AND OPTICAL SENSING SYSTEMS IN LAB-ON-A-CHIP PLATFORMS
Aleksandra Pokrzywnicka, Patrycja Śniadek, and Rafal Walczak
Wrocław University of Science and Technology, POLAND

W195.f MACHINE LEARNING BASED IMAGE ANALYSIS OF OPTICALLY DETECTED NEURONS CULTURED *IN-VITRO* ON HIGH-DENSITY MICRO-PILLAR SUBSTRATES AND CHIPS
Ana Bedalov[1,2], Tihana Marcluš[1], and Damir Sapunar[1]
[1] *University of Split, CROATIA and* [2] *Bedalov d.o.o for Research, Development, Innovation and Consulting, CROATIA*

W196.f MAGNETIC LEVITATION-BASED PROTEIN DETECTION USING LENSLESS DIGITAL INLINE HOLOGRAPHIC MICROSCOPY
Sena Yaman, Kerem Delikoyun, and H. Cumhur Tekin
Izmir Institute of Technology, TURKEY

W197.f PHOTO-THERMALLY ENHANCED LIGHT SCATTERING METHOD FOR NANO PARTICLE DETECTION
Dan Maeda, Kazuma Mawatari, and Takehiko Kitamori
University of Tokyo, JAPAN

W198.f PORTABLE 3D PRINTED COLORIMETRIC SENSOR FOR REMOTE SOIL MEASUREMENT
Sepideh Keshan Balavandy[1], Fernando Maya[1], Ashley Townsend[1], Kimberley Frederick[2], and Michael C. Breadmore[1]
[1] *University of Tasmania, AUSTRALIA and* [2] *Skidmore College, USA*

W199.f REGULATION OF LIPID DROPLETS IN LIVE PREADIPOCYTES USING OPTICAL DIFFRACTION TOMOGRAPHY AND RAMAN SPECTROSCOPY
Patricia Y. Liu, Chao M. Hsieh, Lip K. Chin, Yuzhi Shi, Shilun Feng, Jingbo Zhang, and Wee Ser
Nanyang Technological University, SINGAPORE

f - Sensors and Detection Technologies

Physical Sensors

M200.f BIOMECHANICAL STUDY OF LIVING CAENORHABDITIS ELEGANS EMBRYOS USING CELLULAR FORCE MICROSCOPY
Roger Krenger[1], Jan T. Burri[2], Thomas Lehnert[1], Bradley J. Nelson[2], and Martin A.M. Gijs[1]
[1] *École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND and* [2] *ETH Zürich, SWITZERLAND*

Physical Sensors

M201.f **10-μm-THICK ON-CHIP TRANSPARENT FLOW VELOCITY SENSOR FABRICATED BY FEMTOSECOND LASER**
Yaxiaer Yalikun[1,2], Pan Kaige[1], Yo Tanaka[2,3], and Yoichiroh Hosokawa[1]
[1]*Nara Institute of Science and Technology, JAPAN,* [2]*RIKEN, JAPAN, and* [3]*Osaka University, JAPAN*

M202.f **SURFACE-PATTERNED SILICON CANTILEVER INTEGRATED WITH STRAIN SENSOR TO EVALUATE CONTRACTILE BEHAVIORS IN REAL TIME**
Mingming Dong, Nomin-Erdene Oyunbaatar, Dong-Su Kim, and Dong-Weon Lee
Chonnam National University, KOREA

T199.f **A LIQUID-METAL ENCAPSULATED BAND-AID LIKE SENSOR FOR NON-INVASIVE MONITORING OF FONTANELLE PRESSURE OF INFANTS**
Ziyi Huang, Baoyue Zhang and Jaewon Park
Southern University of Science and Technology, CHINA

T200.f **LOW SAMPLE CONSUMING, PORTABLE VISCOMETER BASED ON LAPLACE-INDUCED-PUMPING AND REFRACTION FOR HEMORHEOLOGY**
Matthias Hermann[1], Kyle Bachus[1], Graham Gibson[2], and Richard Oleschuk[1]
[1]*Queen's University, CANADA and* [2]*CMC Microsystems, CANADA*

T201.f **REAL-TIME SENSING OF OSTEOCLAST ACTIVITY ON A MICROFLUIDIC CHIP BY ELECTRICAL IMPEDANCE**
Alexander P.M. Guttenplan[1], Marijn Lemmens[2], Gilles Oudebrouckx[2], Daniel de Melo Pereira[1], Hoon Suk Rho[1], Zeinab Tahmasebi Birgani[1], Stefan Giselbrecht[1], Roman K. Truckenmüller[1], Ronald Thoelen[2], and Pamela Habibovic[1]
[1]*Maastricht University, THE NETHERLANDS and* [2]*Hasselt University, BELGIUM*

T202.f **SURFACE-TEXTURED PHOTOSENSITIVE POLYMER THIN FILM AS NEW CRACK-BASED STRAIN SENSOR TO MONITOR HUMAN MOTION**
Jongsung Park[1], Dong-Su Kim[1], Ji-Kwan Kim[2], and Dong-Weon Lee[1]
[1]*Chonnam National University, KOREA and* [2]*Gwangju University, KOREA*

W200.f **LIQUID METAL-EMBEDDED MICROFLUIDIC PRESSURE SENSOR FOR REAL-TIME MONITORING**
Kelu Peng[1], Sunghyun Cho[2], Junyi Yao[1], Younghak Cho[3], Hyunsoo Kim[2], and Jaewon Park[1]
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[2]*Korea Institute of Machinery and Materials (KIMM), KOREA, and*
[3]*Seoul National University of Science and Technology, KOREA*

Physical Sensors

W201.f MEASURING MAGNETIC SUSCEPTIBILITY OF PARAMAGNETIC SOLUTION USING DIAMAGNETIC REPULSION OF POLYMER MICROPARTICLES
Bong Hwan Jang, Seyong Kwon, and Joo H. Kang
Ulsan National Institute of Science and Technology (UNIST), KOREA

W202.f SINGLE BACTERIA DETECTION VIA PIEZOELECTRIC SUSPENDED MICROCHANNEL RESONATORS
Annalisa De Pastina[1,2], Damien Maillard[1], Birge Özel Duygan[3], Jan Roelof Van Der Meer[3], and Luis Guillermo Villanueva[1]
[1]*École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND,*
[2]*Trinity College Dublin, IRELAND, and*
[3]*University of Lausanne, SWITZERLAND*

f - Sensors and Detection Technologies

Others

M203.f FACILE FABRICATION OF FULLY INTEGRATED PAPER-BASED ORIGAMI MICRODEVICE FOR COLORIMETRIC DISCRIMINATION OF VIABLE PATHOGENS
Phuoc Tung Trieu, Woo Ri Chae and Nae Yoon Lee
Gachon University, KOREA

T203.f INKJET 3D-PRINTED MICROCANTILEVER NANOGRAM RESOLUTION MASS SENSOR
Patrycja Sniadek, Bartosz Kawa, and Rafal Walczak
Wrocław University of Science and Technology, POLAND

W203.f DISPOSABLE MULTI-SENSORS FOR DIRECT DETECTING PH, CONDUCTIVITY AND TEMPERATURE OF SALIVA IN MOUTH
Wei-Sin Kao, Wei-Hsing Yen, Yu-Wen Hung, and Che-Hsin Lin
National Sun Yat-sen University, TAIWAN

W204.f PATTERN CLASSIFICATION AND SEGMENTATION IN MULTIDEMENSIONAL DNA CONCENTRATION SPACES BY SYNTHETIC CHEMICAL REACTION NETWORK
Shu Okumura[1], Guillaume Gines[2], Yannick Rondelez[2], Teruo Fujii[1], and Anthony Genot[1]
[1]*University of Tokyo, JAPAN and* [2]*PSL Research University, FRANCE*

g - Other Applications of Microfluidics

Artificial Intelligence and Microfluidics

M204.g **DEEP CONVOLUTIONAL NEURAL NETWORKS FOR VIABILITY ANALYSIS DIRECTLY FROM CELL HOLOGRAMS CAPTURED USING LENSLESS HOLOGRAPHIC MICROSCOPY**
Kerem Delikoyun, Ersin Cine, Muge Anil-Inevi, Engin Ozcivici, Mustafa Ozuysal, and H. Cumhur Tekin
Izmir Institute of Technology, TURKEY

T204.g **DEEP LEARNING ANALYSIS OF NEUTROPHIL NUCLEAR MORPHOLOGY DURING NETOSIS USING A MICROFLUIDIC DEVICE**
Alan M. Gonzalez-Suarez, Roberto Rodriguez-Moncayo, Jose A. Hernandez-Ortiz, and Jose L. Garcia-Cordero
Centro de Investigacion y de Estudios Avanzados del IPN, MEXICO

g - Other Applications of Microfluidics

Fuel Cells

M205.g **DRYING CAPABILITY OF RMFC MICO-CHANNEL EVAPORATOR WITH IMPROVED FLOW DISTRIBUTION, GAS VENTING MANIFOLD AND ARTIFICIAL CAVITIES**
Hung-Yu Chen[1], Fan-Gang Tseng[1,2], and Chin Pan[3]
[1]*National Tsing Hua University, TAIWAN,* [2]*Academia Sinica, TAIWAN and* [3]*City University of Hong Kong, HONG KONG*

W205.g **A HIGH HYDROGEN CONVERSION AND HIGH-TEMPERATURE CATALYTIC HYDROGEN MICRO-CHIP COMBUSTOR APPLIED TO THERMAL MANAGEMENT FOR METHANOL REFORMER**
Ming-Jyun Li[1], Shang-Yun Huang[1], and Fan-Gang Tseng[1,2]
[1]*National Tsing Hua University, TAIWAN and* [2]*Academia Sinica, TAIWAN*

g - Other Applications of Microfluidics

Microfluidics for X-Ray and e-Beam Applications

M206.g **DROPLET TRIGGERING FOR SERIAL FEMTOSECOND CRYSTALLOGRAPHY USING 3D-PRINTED MICROFLUIDICS**
Daihyun Kim, Austin Echelmeier, Jorvani Cruz Villarreal, Sahir Gandhi , Sebastian Quintana, Ana Egatz-Gomez, and Alexandra Ros
Arizona State University, USA

M207.g **TRACKING TRANSIENT CHANGES ON THE MILLI-SECOND TIME-SCALE: X-RAY SPECTROSCOPY AND MICROFLUIDIC MIXING**
Thomas Kroll[1], Leland B. Gee[2], Diego A. Huyke[2], Augustin Braun[2], Michael Mara[2], Matthew James[2], Ashwin Ramachandran[2], Dimosthenis Sokaras[1], Uwe Bergmann[1], Edward I. Solomon[2], Daniel P. DePonte[1], and Juan G. Santiago[2]
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T205.g **A THREE-DIMENSIONAL MICROFLUIDIC MIXER WITH INDEPENDENTLY ADJUSTABLE MIXING AND PROBING REGIONS**

Diego A. Huyke[1], Ashwin Ramachandran[1], Thomas Kroll[2], Daniel P. Deponte[2], and Juan G. Santiago[1]
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[2] *SLAC National Accelerator Laboratory, USA*

T206.g **SAMPLE CONSUMPTION REDUCTION FOR SERIAL CRYSTALLOGRAPHY USING WATER-IN-OIL DROPLETS**

Austin Echelmeier[1], Jorvani Cruz Villarreal[1], Daihyn Kim[1], Sahir Gandhi[1], Ana Egatz-Gomez[1], Darren Thifault[1], Jesse D. Coe[1], Gerrit Brehm[2], Caleb Madsen[1], Sebastian Quintana[1], Saša Bajt[4], Marc Messerschmidt[1,3], Jose Domingo Meza-Aguilar[1], Dominik Oberthüer[4], Max O. Wiedorn[4], Holger Fleckenstein[4], Sabine Botha[1], Derek Mendez[1], Juraj Knoska[4], Jose Martin Garcia[1], Hao Hu[1], Stella Lisova[1], Aschkan Allah Gholi[4], Yaroslav Gevorkov[4], Kartik Ayyer[4], Steve J. Aplin[4], Helen M. Ginn[5], Heinz Graafsma[4], Andrew J. Morgan[4], Dominic Greiffenberg[6], Alexander Klujev[4], Torsten Laurus[4], Jennifer Poehlsen[4], Ulrich Trunk[4], Filipe R.N.C. Maia[7], Davide Mezza[6], Raimund Fromme[1], Britta Weinhausen[3], Grant Mills[3], PatrikVagovic[3], Yoonhee Kim[3], Joachim Schulz[3], Katerina Döerner[3], Jolanta Sztuk-Dambietz[3], Manuela Kuhn[4], Thomas D. Grant[8], Thomas A. White[4], Valerio Mariani[4], Anton Barty[4], Adrian P. Mancuso[3], Uwe Weierstall[1], John C.H. Spence[1], Henry N. Chapman[4], Nadia A. Zatsepin[1], Petra Fromme[1], Richard A. Kirian[1], and Alexandra Ros[1]
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T207.g **UNDERSTANDING THE LIPID NANOPARTICLES STRUCTURE DYNAMICS USING A TIME-RESOLVED SAXS MEASUREMENT**

Masatoshi Maeki[1], Niko Kimura[1], Kazuki Shimizu[2], Kento Yonezawa[2], Nobutaka Shimizu[2], Akihiko Ishida[1], Hirofumi Tani[1], and Manabu Tokeshi[1]
[1] *Hokkaido University, JAPAN and*
[2] *High Energy Accelerator Reseaerch Organization, JAPAN*

W206.g **CRYO-MICROFLUIDIC DEVICES ENABLE MILLISECOND TIME-CORRELATION BETWEEN LIVE-IMAGING AND CRYO-ELECTRON MICROSCOPY IN CAENORHABDITIS ELEGANS**

Marie Fuest[1], Miroslava Schaffer[2], Giovanni Marco Nocera[1], Rodrigo I. Galilea-Kleinsteuber[1], Michael Heymann[2], Jürgen M. Plitzko[2], and Thomas P. Burg[1,3]
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[2] *Max Planck Institute of Biochemistry, GERMANY, and*
[3] *Technische Universität Darmstadt, GERMANY*

Microfluidics for X-Ray and e-Beam Applications

W207.g TIME-RESOLVED STRUCTURE DETERMINATION VIA RAPID MIXING MICROFLUIDICS

Martin Trebbin[1,2] and Diana C.F. Monteiro[1]
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[2] *Hauptman-Woodward Medical Research Institute, USA*

g - Other Applications of Microfluidics

Power Devices

W208.g ION BASED PRESSURE DRIVEN ELECTRIC POWER GENERATOR USING MICRO/NANO GLASS POROUS DEVICE

Yo Tanaka[1], Satoshi Amaya[1], Wataru Nagafuchi[1], Norihiro Kamamichi[2], and Yaxiaer Yalikun[1]
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g - Other Applications of Microfluidics

Others

M208.g A MICRO-FLUIDIC DEVICE TO MEASURE ANTIOXIDATIVE CAPACITY OF TEA CATECHINS

Alexandra Homsy[1], Laure Jeandupeux[1], Marzena Walaszczyk[1], Claudio Prieur[1], Frédéric Truffer[1], Martial Geiser[1], Isabelle Udrisard[1], Agnieszka Kosinska Cagnazzo[1], Wilfried Andlauer[1], and Harry J. Whitlow[2]
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M209.g DEVELOPMENT OF CONTROLLED RELEASE TABLET REAGENTS EMBEDDED COMPACT NUTRIENT ANALYZER FOR CONTINUOUS MONITORING OF NUTRIENT CONTENT IN CROP BODY

Toshihiro Kasama[1,4], Naoki Hirohama[1,4], Yoshishige Endo[1,4], Takumi Okamoto[2,4], Tetsushi Koide[2,4], Chiharu Sone[3,4], Masashi Komine[3,4], Yukio Yaji[3,4], Atsushi Ogawa[3,4], and Ryo Miyake[1,4]
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[3] *Akita Prefectural University, JAPAN, and*
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T208.g ARTIFICIAL PHEROMONE EFFECT IMPOSED ON REAL LIVING MICROALGAE CELLS CONFINED IN A MICROCHIP WITH OPTICAL FEEDBACK SYSTEM

Kazunari Ozasa[1], June Won[2], Simon Song[2], and Mizuo Maeda[1]
[1] *RIKEN, JAPAN and* [2] *Hanyang University, KOREA*

T209.g THE UNIVERSAL LAB-ON-CHIP PLATFORM FOR BIO-NANOSATELLITE

Agnieszka Podwin[1], Adrianna Graja[1,2], Dawid Przystupski[3], Danylo Lizanets[1,4], Jan A. Dziuban[1], and Rafal Walczak[1]
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[2] *SatRevolution S.A., POLAND,* [3] *Wrocław Medical University, POLAND, and* [4] *Lviv Polytechnic National University, UKRAINE*

Others

W209.g CONTINUOUS FLOW ANALYSIS OF ATMOSPHERIC ICE-NUCLEATING PARTICLES IN THE EASTERN MEDITERRANEAN
Mark D. Tarn[1], Sebastien N.F. Sikora[1], Grace C.E. Porter[1], Bethany V. Wyld[1], Naama Reicher[2], Matan Alayof[2], Alexander D. Harrison[1], Yinon Rudich[2], Jung-uk Shim[1], and Benjamin J. Murray[1]
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W210.g MEASURING THE NUCLEATION KINETICS OF ARAGONITE USING A SELF-DIGITIZATION MICROFLUIDIC CHIP
Zongwei Zhang, Yuan Gao, Shunbo Li, and Gang Li
Chongqing University, CHINA

h – Late News

Cells, Organisms and Organs on a Chip

M210.h 3D CULTURE STRATEGY TO ENHANCE HAIR INDUCTIVE POTENTIAL OF HUMAN HAIR FOLLICLE DERIVED DERMAL PAPILLA CELLS
Seongkyun Choi, Jinchul Ahn, Ji Hun Yang, and Seok Chung
Korea University, KOREA

M211.h CONTROLLED GIANT VESICLE ASSEMBLY AND MANIPULATION USING MEMBRANE DISPLACEMENT TRAPS
Zhu Chen[1], Hesam Babahosseini[1,2], Supriya Padmanabhan[1], Tom Misteli[2], and Don L. DeVoe[1]
[1] *University of Maryland, College Park, USA and*
[2] *National Institutes of Health, USA*

M212.h DUAL-FLOW MICROFLUIDIC DEVICE FOR MODELLING BIOLOGICAL BARRIER SYSTEMS
Lydia Baldwin, Alex Iles, John Greenman, Nicole Pamme, and Charlotte E. Dyer
University of Hull, UK

M213.h HYDROGEL-BASED SEALED MICROCHAMBERS FOR SIMPLE AND COST-EFFECTIVE CELL CULTURE AND DRUG TESTING
Shotaro Yoshida, Kensuke Sumomozawa, and Matsuhiko Nishizawa
Tohoku Univerisity, JAPAN

M214.h INTEGRATION OF ON-CHIP CLUSTER PURIFICATION AND COMPARTMENTALIZATION FOR RNA-SEQ ANALYSIS OF CLUSTERS
Hiroaki Saito[1], Soo Hyeon Kim[1], Issei Tsuchiya[1], Satoi Nagasawa[1], Masahide Seki[1], Yusuke Komazaki[1], Toru Torii[2], Yutaka Suzuki[1], and Teruo Fujii[1]
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M215.h REPEATED SINGLE CELL CYTOMETRY IN AN OPTOFLUIDIC CHIP
Gregory A. Cooksey[1], Paul N. Patrone[1], Nikita Podobedov[2], Stephen E. Meek[3], and Jason A. Hsu[4]
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[2] *Columbia University, USA,* [3] *Montgomery College, USA, and*
[4] *Montgomery Blair High School, USA*

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M216.h **WRINKLE TEXTURE GUIDED CELL GROWTH ORIENTATION**
Bing-Cheng Jiang and Ya-Yu Chiang
National Chung-Hsing University, TAIWAN

T210.h **A MICROFLUIDIC DEVICE FOR TESTING STATIC AND DYNAMIC, *IN VIVO* LIKE, DRUG CONCENTRATION EFFECTS ON CANCER CELLS**
Job Komen[1], Eiko Y. Westerbeek[1,2], Andries D. van der Meer[1], and Albert van den Berg[1]
[1] *University of Twente, THE NETHERLANDS and*
[2] *Vrije Universiteit Brussel, BELGIUM*

T211.h **CIRCULATING TUMOR CELL ISOLATION FROM CLINICAL SAMPLES UTILIZING A LATERAL FILTER ARRAY MICROFLUIDIC DEVICE**
Pablo J. Dopico[1], Kangfu Chen[1], Jose Varillas[1], Valber Pedrosa[2], Thomas J. George[1], and Z. Hugh Fan[1]
[1] *University of Florida, USA and* [2] *São Paulo State University, BRAZIL*

T212.h **DEVELOPMENT OF A MICROFLUIDIC PLATFORM FOR INDUCTION OF ANGIOGENESIS FROM A VASCULARIZED MICROTISSUE**
Wen-Chih Yang, Che-Yu Lin, Wei-Wen Liu, Pai-Chi Li, and Yu-Hsiang Hsu
National Taiwan University, TAIWAN

T213.h **ENGINEERED 3D VASCULARIZED NEUROSPHERE-DERIVED FROM INDUCED NEURAL STEM CELL IN AN INJECTION-MOLDED MICROFLUIDIC ARRAY**
Youngtaek Kim, Nari Shin, Jihoon Ko, Jungho Ahn, Kyung-Sun Kang, and Noo Li Jeon
Seoul National University, KOREA

T214.h ***IN VITRO* MICROFLUIDICS-BASED BLOOD-BRAIN BARRIER MODEL WITH IN-LINE TEER MEASUREMENT**
Kai-Hong Tu and Ya-Yu Chiang
National Chung Hsing University, TAIWAN

T215.h **INTESTINE-ON-A-CHIP FOR ANTICANCER NANOPARTICLE TESTING**
Oihane Mitxelena-Iribarren[1,2], Claudia Olaizola[2], Sergio Arana[1,2], and Maite Mujika[1,2]
[1] *Ceit, SPAIN and* [2] *Universidad de Navarra, SPAIN*

T216.h **ROBOTIC CAPTURE AND MANIPULATION OF CELLS USING MAGNETIC MICROWHEELS**
Tonguc O. Tasci[1], Tao Yang[2], Avanish Mishra[1], Keith Neeves[2], David Marr[2], and Mehmet Toner[1]
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W211.h **A REUSABLE LAB-ON-A-CHIP FOR BACTERIA ENRICHMENT FROM LARGE VOLUMES**
Matthias Hügle[1,2], Benedict Martens[1], Ole Behrmann[1,2], Frank T. Hufert[2], Gregory Dame[2], and Gerald A. Urban[1]
[1] *University of Freiburg, GERMANY and*
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W212.h **A VERSATILE MICROPATTERNING APPROACH FOR STUDYING LIVE CELL SIGNALING EVENTS**
Peter Lanzerstorfer[1], Ulrike Müller[1], Roland Hager[1], Cindy Dirscherl[2], Klavdiya Gordiyenko[3], Christof M. Niemeyer[3], Sebastian Springer[2], and Julian Weghuber[1]
[1] *University of Applied Sciences Upper Austria, AUSTRIA,* [2] *Jacobs University, GERMANY, and* [3] *Karlsruhe Institute of Technology (KIT), GERMANY*

W213.h **DIFFUSION FROM STEADY-STATE PROFILE (DSSP) FOR LOW COST, LOW CONCENTRATION MEASUREMENT OF DIFFUSION**
Joshua T. Loessberg-Zahl[1], Marc R. Gillrie[2], Roger D. Kamm[2], Albert van den Berg[1], Andries van der Meer[1], and Jan C.T. Eijkel[1]
[1] *Technical University of Twente, THE NETHERLANDS and* [2] *Massachusetts Institute of Technology, USA*

W214.h **EXPLORING THE BIOPHYSICAL FACTOR CAUSING BREAST CANCER CELL METASTASIZE WITH ORGANTYPIC NICHE-ON-A-CHIP**
Chun-Jieh Hsu[1], Hsueh-Yao Chu[1], Yin-Ju Chen[2], Long-Sheng Lu[2], and Fan-Gang Tseng[1,3]
[1] *National Tsing Hua University, TAIWAN,* [2] *Taipei Medical University Hospital, TAIWAN, and* [3] *Academia Sinica, TAIWAN*

W215.h **INSERTION MEASUREMENT OMPLA PROTEIN INTO LIPID BILAYER USING ION CURRENT MEASUREMENT DEVICE**
Seren Ohnishi and Koki Kamiya
Gunma University, JAPAN

W216.h **MICROFLUIDIC PLATFORM FOR IMPLEMENTATION OF ORGANIC FIELD EFFECT TRANSISTOR BASED BIOSENSOR**
Liubov Bakhchova and Ulrike Steinmann
Otto-von-Guericke-University, GERMANY

W217.h **THE ROLE OF INTERFACE CURVATURE ON SPERM BEHAVIOUR**
Mohammad Reza Raveshi, Melati Abdul Halim, Adrian Neild, and Reza Nosrati
Monash University, AUSTRALIA

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M217.h **CELL-FREE HIGH-THROUGHPUT PROTEIN SYNTHESIS USING MESOSCALE DEVICES**
Karim Mohamed[1], Champak Das[2], Shouguang Jin[1], and Z. Hugh Fan[1]
[1] *University of Florida, USA and* [2] *Dasfanh Bioscience LLC, USA*

M218.h **EFFECTIVE MIXING IN A MICRO REACTION CHAMBER USING MAGNETIC MICRO BEADS FOR INCREASED MOLECULAR SENSING READOUT TIME**
Eriola-Sophia Shanko, Yoeri van de Burgt, and Jaap den Toonder
Technische Universiteit Eindhoven (TU/e), THE NETHERLANDS

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M219.h **SHAPE- AND SIZE-CONTROLLED MICROGEL PARTICLES**
Daniel Debroy, John Oakey, and Katie Dongmei Li-Oakey
University of Wyoming, USA

T217.h **A MICROCHIP ELECTROPHORESIS – ELECTROCHEMICAL DETECTION (ME-EC) SYSTEM TO MONITOR OXIDATIVE MODIFICATIONS OF PROTEIN-BOUND TYROSINE AND PHENYLALANINE AS *IN VIVO* BIOMARKERS FOR OXIDATIVE STRESS**
Dhanushka B. Weerasekara and Susan M. Lunte
University of Kansas, USA

T218.h **COMBINATIONAL DIFFUSIOPHORETIC AND ELECTROPHORETIC NANOPARTICLE SEPARATION**
Kyunghun Lee[1], Jongwan Lee[1], Dogyeong Ha[1], Minseok Kim[2], and Taesung Kim[1]
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[2]*Kumoh National Institute of Technology, KOREA*

T219.h **HIGH-THROUGHPUT DROPLET MICROREACTOR FOR CATALYTIC ACTIVITY SCREENING OF SOLID CATALYST PARTICLES**
Jeroen C. Vollenbroek[1], Anne-Eva Nieuwelink[2], Johan G. Bomer[1], Ronald M. Tiggelaar[1], Albert Van den Berg[1], Bert M. Weckhuysen[2], and Mathieu Odijk[1]
[1]*University of Twente, THE NETHERLANDS and*
[2]*Utrecht University, THE NETHERLANDS*

T220.h **SYNTHESIS OF MONODISPERSE GOLD NANOPARTICLES IN FOUR PHASES MICROFLUIDICS BY CONTROLLING FLOW RATE DIFFERENCE**
Yuanwei Wang, Hayato Ogawa, and Hiromasa Yagyu
Kanto Gakuin University, JAPAN

W218.h **A REPULSIVE POINT-SOURCE DIFFUSIOPHORESIS DEVICE FOR NANOPARTICLE SEPARATION**
Sangjin Seo, Dogyeong Ha, and Taesung Kim
Ulsan National Institute of Science and Technology (UNIST), KOREA

W219.h **COMPARATIVE STUDY OF LIQUID-PHASE AUTOXIDATION OF INDAN IN MICROFLUIDIC REACTORS**
Muhammad Siddiquee, Yucheng Wu, and Neda Nazemifard
University of Alberta, CANADA

W220.h **PEO CAN IMPROVE THE RESOLUTION OF SIZE-BASED SEPARATIONS IN SPIRAL CHANNELS**
Alex Jafek, Haidong Feng, Hayden Brady, Raheel Samuel, and Bruce Gale
University of Utah, USA

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M220.h **A MICROFLUIDIC CAVITATION-MICROSTREAMING DNA EXTRACTOR**
Abdi M. Kaba, Hyunjin Jeon, and Dohyun Kim
Myongji University, KOREA

M221.h **DEVELOPMENT OF A SIMPLE LAB-ON-A-CHIP SYSTEM FOR THE SENSITIVE IMMUNOASSAY-BASED DETECTION OF BACTERIAL PATHOGENS FROM FOOD SAMPLES**
Suk-Jung Choi and Hee-Jung Kim
Gangneung-Wonju National University, KOREA

M222.h **GRAVITY-DRIVEN MICROFLUIDIC SPUTUM HOMOGENIZER**
Korakot Boonyaphon and Sung-Jin Kim
Konkuk University, KOREA

M223.h **MICROCHANNELS FOR PRECONCENTRATING SWEAT**
Hirotada Hirama[1], Ryutaro Otahara[2], and Masanori Hayase[2]
[1] *National Institute of Advanced Industrial Science and Technology (AIST), JAPAN and* [2] *Tokyo University of Science, JAPAN*

M224.h **MITIGATION OF CHANNEL CLOGGING IN A DETERMINISTIC LATERAL DISPLACEMENT BLOOD PROCESSING DEVICE BY POLYAMINE INDUCED DNA FOLDING**
Tatsuya Yoshizawa[1], Yuki Jingu[1], Yuki Oka[1], Masaru Irita[1], Toshihiro Suzuki[2,3], Tetsuya Nakatsura[3], Masato Kubo[1], Ryushin Mizuta[1], and Masanori Hayase[1]
[1] *Tokyo University of Science, JAPAN,* [2] *Teikyo University, JAPAN, and* [3] *National Cancer Center Japan, JAPAN*

M225.h **ON CHIP PLATFORM FOR TAU PROTEIN AGGREGATION AND ALZHEIMER'S DRUG DOSE RESPONSE**
Shubha Jain, Lopamudra Das, Sarpras Swain, Lopamudra Giri, and Harikrishnan Narayanan Unni
Indian Institute of Technology (IIT Hyderabad), INDIA

M226.h **QUICK ISOLATION OF CIRCULATING TUMOR CELLS FROM HUMAN WHOLE BLOOD BY A NOVEL MICROFUIDIC DESIGN**
Sung-Chi Tsai, Yi-Jen Chen, Wen-Yi Chang, Pyea-Yoo Kim, Yun-Chi Tsai, and Howard Doong
LifeCode Biotech Co., TAIWAN

M227.h **A SINGLE TUBE ASSAY BASED ON DUAL-ELECTROSTATIC INTERACTION STRATEGY FOR RAPID AND ULTRASENSITIVE PATHOGENIC BACTERIA DETECTION**
Feixiong Chen[1], Dao Thi Thuy Nguyen[2], Yong Shin[2], and Tae Yoon Lee[1]
[1] *Chungnam National University, KOREA and*
[2] *University of Ulsan College of Medicine, KOREA*

T221.h **AMPHIPHILIC POLY(α)GLUTAMATE AS RNA INTERFERENCE NANOCARRIER TO BRAIN TUMORS**
Adva Krivitsky, Eilam Yeini, Sabina Pozzi, Sapir Golan, Evgeni Pisarevsky, and Ronit Satchi-Fainaro
Tel-Aviv University, ISRAEL

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T222.h **CAPACITIVE SENSING OF TRIGLYCERIDE FILM REACTIONS TO DUODENAL CONTENTS**

George E. Banis, Luke A. Beardslee, Justin M. Stine, and Reza Ghodssi
University of Maryland, USA

T223.h **INTEGRATED PROTOTYPE FOR POINT-OF-CARE DIAGNOSIS OF CHLAMYDIA TRACHOMATIS INFECTIONS**

Shivani Sathish, Kazumi Toda-Peters, and Amy Q. Shen
Okinawa Institute of Science and Technology (OIST), JAPAN

T224.h **MICROFLUIDIC SYSTEM USING A HOMOBIFUNCTIONAL IMIDOESTER FOR SIMULTANEOUS BIOMOLECULES ISOLATION**

Yoon Ok Jang[1], Choong Eun Jin[1], Bonhan Koo[1], Tae Yoon Lee[2], and Yong Shin[1]
[1] *University of Ulsan College of Medicine, KOREA and*
[2] *Chungnam National University, KOREA*

T225.h **NEURONAL CULTURE AT SINGLE CELL LEVEL FOR CREATION OF BIOLOGICAL NEURONAL NETWORK**

Stephany Mai Nishikawa[1], Soo Hyeon Kim[1], Yoshiho Ikeuchi[1], Timothée Levi[1,2], and Teruo Fujii[1]
[1] *University of Tokyo, JAPAN and* [2] *University of Bordeaux, FRANCE*

T226.h **PERFORMANCE OF USING DEFORMABILITY OF ENDOMETRIAL CELLS AS A DIAGNOSTIC TEST FOR ENDOMETRIOSIS**

Ahmad Altayyeb[1], Essam Othman[2], Maha Khashbah[2], Abdelhady Esmaeel[2], Mohamed El-Mokhtar[2], Cornelis Lambalk[3], Velja Mijatovic[3], and Mohamed Abdelgawad[2,4]
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T227.h **SIMULTANEOUS, TRIPLEX COLOURIMETRIC MEASUREMENT OF CARDIAC BIOMARKERS IN FLUOROPOLYMER MICROFLUIDIC STRIPS**

Nuno Reis[1,2,3], Ana Castanheira[1,2], Filipa Pereira[1], and Alexander Edwards[1,4]
[1] *Capillary Film Technology Ltd., UK,* [2] *Loughborough University, UK,* [3] *University of Bath, UK, and* [4] *University of Reading, UK*

T228.h **SYNTHESIS OF BORON-10 ENRICHED CHITOSAN COATED PVA/ALGINATE NANOPARTICLES (CHI/ALG-PVA-B NPS) BY ELECTROSPRAY TECHNIQUE TO TREAT ORAL SQUAMOUS CELL CARCINOMA BY BORON NEUTRON CAPTURE THERAPY (BNCT)**

Han-Lin Cho[1], Venkanagouda S. Goudar[1], Wei-Jen Chan[1], and Fan-Gang Tseng[1,2]
[1] *National Tsing Hua University, TAIWAN and* [2] *Academia Sinica, TAIWAN*

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W221.h 3-DIMENSIONAL PAPER-BASED SAMPLE PREPARATION DEVICE FOR EXOSOME ISOLATION/PRECONCENTRATION
Hyerin Kim[1], Kyu Hyoung Lee[2], Sung Il Han[3], Dongho Lee[3], Yong Kyoung Yoo[1], Cheonjung Kim[1], Junwoo Lee[1], Ganghyeon Kim[1], Seok Chung[4], Dohwan Lee[1,5], and Jeong Hoon Lee[1]
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W222.h ASSESSMENT OF CHIMERIC ANTIGEN RECEPTOR T (CAR-T) CELL CYTOTOXICITY USING DROPLET MICROFLUIDICS
Haitao Wang[1], Johnny Kuan-Un Wong[1], Jingxuan Shi[2,3], Yanwei Jia[1], Chuxia Deng[1], Lianmei Jiang[4], Peng Li[2], and Ada Hang-Heng Wong[1]
[1]*University of Macau, MACAU,* [2]*Chinese Academy of Science, CHINA,* [3]*University of Chinese Academy of Sciences, CHINA, and* [4]*Macquarie University, AUSTRALIA*

W223.h GUIDING 3D PODOCYTE CELLS CULTIVATION ON THE OUTER COAXIAL ALGINATE TUBES TO MAKE GLOMERULAR ON THE CHIP
Yin-Yun Chen[1], Jyun-Wei Chen[1], Jie-Sheng Chen[1], Yi-Ching Ko[2], Hsiang-Hao Hsu[2], and Fan-Gang Tseng[1,3]
[1]*National Tsing Hua University, TAIWAN,* [2]*Kinkou Chang Gung Memorial Hospital, TAIWAN, and* [3]*Academia Sinica, TAIWAN*

W224.h MACROPHAGE ACCELERATES INFLAMMATION OF PANCREATIC β-CELL AGGREGATES
Marie Shinohara, Thalia Nghiem, Qiao You Lau, Fumiya Tokitou, and Yasuyuki Sakai
University of Tokyo, JAPAN

W225.h MINIATURIZED EXOSOME ISOLATION SYSTEM USING CATIONIC POLYMER AND SYRINGE FILTER
Chanhee Park, Jinhyun Kim, Hoyoon Lee, Jina Choi, Hyunsung Kim, and Sehyun Shin
Korea University, KOREA

W226.h OPTIMIZATION OF THE THIN-LAYERED ELISA AND STORAGE OF THE MICROCHIP
Adelina Smirnova, Ryoichi Ohta, Kazuma Mawatari, and Takehiko Kitamori
University of Tokyo, JAPAN

W227.h PAPER-BASED MINIATURIZED DEVICE FOR DETECTION OF BETA-LACTAM ANTIBIOTICS IN MILK
Sammer-ul Hassan[1], Prashant Goel[2], Naresh Kumar[2], and Xunli Zhang[1]
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[2]*National Dairy Research Institute, INDIA*

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W228.h **SINGLE LASER-DETECTOR BASED MULTIPLEXED FLUORESCENCE MEASUREMENT IN DROPLET MICROFLUIDICS USING ON-CHIP FIBRE OPTICS**
Ambili Mohan[1], Preksha Gupta[2], Taslimarif Saiyed[2], and Anil Prabhakar[1]
[1]*Indian Institute of Technology, INDIA and*
[2]*Centre for Cellular and Molecular Platforms, INDIA*

W229.h **TOWARD A DROPLET-BASED FLUORESCENCE ASSAY FOR CRISPR-CAS9 ENGINEERING**
Alexandre Baccouche, Kevin Montagne, Hiroshi Nishimasu, Nozomu Yachie, Osamu Nureki, Teruo Fujii, and Anthony J. Genot
University of Tokyo, JAPAN

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M228.h **ACOUSTOPHORESIS IN GEL-FILLED MICROCHANNELS TOWARDS *IN VIVO*-LIKE CELL MANIPULATION AND CELL MIGRATION STUDIES**
Michael Heiss and Rune Barnkob
Technical University of Munich, GERMANY

M229.h **AXIAL ELECTROKINETIC TRAPPING OF SINGLE PARTICLES AT KHZ FEEDBACK RATES**
Filip Strubbe, Vincent De Clercq, and Yerzhan Y. Ussembayev
Ghent University, BELGIUM

M230.h **COUPLING ELECTROTHERMAL ROLLS AND DIELECTROPHERESIS FOR CONTINUOUS-FLOW SEPARATION OF NANOPARTICLES**
Stanley D.E. Kushigbor and Levent Yobas
Hong Kong University of Science and Technology, HONG KONG

M231.h **DNA EXTRACTION FROM CULTURE MEDIUM BY USING EWOD SYSTEM**
Chen-En Chiang[1], Tzu-Hui Wu[2], Pei-Shin Jiang[2], Chien-An Chen[2], and Da-Jenf Yao[1]
[1]*National Tsinghua University, TAIWAN and*
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M232.h **FERROHYDRODYNAMICS OF BACTERIAL SWARM CONTROL**
Nima Mirkhani, Thuy Trinh Nguyen, Tinotenda Gwisai, Michael Christiansen, and Simone Schuerle
ETH Zürich, SWITZERLAND

M233.h **HIGH EFFICIENT AND SELECTABLE CONCENTRATION OF BACTERIA AND SERS PARTICLES THROUGH THE SYNERGIC EFFECT OF ACEOF AND DEP FOR RAPID BACTERIAL DETECTION FROM WHOLE BLOOD**
Kuan-Hung Chen[1], Shih-Han Lee[1], Tseren-Onolt Ishdorj[2], Chun-Wei Lee[1], and Fan-Gang Tseng[1,3]
[1]*National Tsing Hua University, TAIWAN,* [2]*Mongolian University of Science and Technology, MONGOLIA, and* [3]*Academia Sinica, TAIWAN*

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M234.h MICRO-SWIMMER TRAP-AND-RELEASE USING STANDING SURFACE ACOUSTIC WAVES

Mingyang Cui[1], Minji Kim[1], Mathieu Bottier[1,2], Philip V. Bayly[1], and J. Mark Meacham[1]
[1] *Washington University, St. Louis, USA and*
[2] *Washington University School of Medicine, St. Louis, USA*

M235.h SIMPLE AND PASSIVE MERGING-ON-DEMAND METHOD FOR REACTION ENGINEERING IN DROPLET MICROFLUIDICS

Medina Hamidović[1], Uli Marta[2], Helen Bridle[2], Gerold Fink[1], Robert Wille[1], Andreas Springer[2], and Werner Haselmayr[1]
[1] *Johannes Kepler University Linz, AUSTRIA and*
[2] *Heriot-Watt University, UK*

T229.h A FULLY INTEGRATED WEARABLE AC ELECTROTHERMAL ACTUATION PLATFORM FOR BIOFLUID MANIPULATION

Haisong Lin, Hannaneh Hojaiji, Shuyu Lin, Christopher Yeung, Yichao Zhao, Bo Wang, Meghana Malige, Yibo Wang, Kimber King, Wenzhuo Yu, Jiawei Tan, Zhaoqing Wang, Xuanbing Cheng, and Sam Emaminejad
University of California, Los Angeles, USA

T230.h CAPILLARY FILLING OF COMPLEX FLUIDS IN MICROCHANNELS WITH ALTERED WETTABILITY

Kiarash Keshmiri[1], Haibo Huang[2], Abebaw Jemere[3], and Neda Nazemifard[1]
[1] *University of Alberta, CANADA,* [2] *InnoTech Alberta, CANADA, and*
[3] *National Research Council of Canada, CANADA*

T231.h DIELECTROPHORESIS CONFINEMENT OF NANO-BIOLOGICAL PARTICLES

Imman I. Hosseini, Zezhu Liu, Walter Reisner, and Sara Mahshid
McGill University, CANADA

T232.h DOUBLE EMULSION GENERATION USING CENTRIFUGAL MICROFLUIDIC PLATFORMS

Masoud Madadelahi[1], Marc J. Madou[1,2], Yeganeh Dorri Nokoorani[3], Amir Shamloo[3], and Sergio O. Martinez-Chapa[1]
[1] *Tecnologico de Monterrey, MEXICO,* [2] *University of California, Irvine, and USA,* [3] *Sharif University of Technology, IRAN*

T233.h FLUIDIZATION AND WALL SLIP OF SOFT GLASSY MATERIALS BY CONTROLLED SURFACE ROUGHNESS

Davide Ferraro[1], Daniele Filippi[1], Ladislav Derzsi[1,4], Piotr Garstecky[4], Giampaolo Mistura[1], Matteo Lulli[2], Massimo Bernaschi[3], Mauro Sbragaglia[2], and Matteo Pierno[1]
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T234.h **IMAGING MICROFLUIDIC FLOWS WITH DNA MICROSCOPY**
Hayato Onoue, Nicolas Lobato-Dauzier, Shu Okumura, Stephane Poulain, Soo Hyeon Kim, Teruo Fujii, and Anthony J. Genot
University of Tokyo, JAPAN

T235.h **MINIATURIZED PROTEOMICS OF MAMMALIAN CELLS ON A DIGITAL MICROFLUIDICS DEVICE**
Jan Leipert and Andreas Tholey
Kiel University, GERMANY

T236.h **WIDE-FIELD IMAGING SYSTEM FOR DIGITAL CFU ASSAY THROUGH 10-MILLION DROPLET ANALYSIS**
Sunghyun Ki, Juhwa Lee, Joel Sánchez Barea, and Dong-Ku Kang
Incheon National University, KOREA

W230.h **AUTOMATED PRE-ANALYTIC PROCESSING OF WHOLE SALIVA ON A CENTRIFUGAL MICROFLUIDIC PLATFORM FOR PROTEIN BIOMARKER ANALYSIS**
Benita Johannsen[1], Lara Müller[1], Desirée Baumgartner[1,2], Lena Karkossa[1], Susanna M. Früh[1,2], Nagihan Bostanci[3], Michal Karpíšek[4], Roland Zengerle[1,2], Nils Paust[1,2], and Konstantinos Mitsakakis[1,2]
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W231.h **CELLPROFILER IS A FIT TOOL FOR DROPLET DIGITAL IMAGE ANALYSIS**
Simona Bartkova, Marko Vendelin, Pille Pata, and Ott Scheler,
Tallinn University of Technology, ESTONIA

W232.h **DIFFERENTIAL SECOND-DEGREE OF FREEDOM CENTRIFUGAL MICROFLUIDICS**
Eimear Higgins[1], Cian Merne[1], Patrick Wogan[1], David Collins[1], Sarai M. Torres-Delgado[2], Dario Mager[2], and David J. Kinahan[1]
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[2]*Karlsruhe Institute of Technology, GERMANY*

W233.h **EASY MODULE CHIP PLATFORM FOR MICROFLUIDICS**
Tae Jae Lee[1], Moon Keun Lee[1], Nam Ho Bae[1], Kyoung G. Lee[1], Yoo Min Park[1], Yun Seok Heo[2], and Seok Jae Lee[1]
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[2]*Keimyung University, KOREA*

W234.h **FLOW PROFILE THROUGH EXPOSED POROUS MEDIA IN CENTRIFUGAL MICROFLUIDICS**
Daniel M. Kainz[1], Susanna M. Früh[1,2], Tobias Hutzenlaub[1,2], Roland Zengerle[1,2], and Nils Paust[1,2]
[1]*University of Freiburg, GERMANY and* [2]*Hahn-Schickard, GERMANY*

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W235.h **MAPPING COMPLEX PRESSURE FIELDS USING SWIMMING MICROORGANISMS**
Minji Kim, Philip V. Bayly, and J. Mark Meacham
Washington University, St. Louis, USA

W236.h **OIL/WATER PARTITIONING AND MICRODIALYSIS FOR CONTROLLED DELIVERY OF HYDROPHOBIC COMPOUNDS IN DROPLET-BASED MICROFLUIDIC SYSTEMS**
Michal Vasina[1], Tomas Buryska[1,2], Pavel Vanacek[1,2], Fabrice Gielen[3,4], Liisa V. Vliet[4], Zdenek Pilat[5], Jan Jezek[5], Pavel Zemanek[5], Jiri Damborsky[1,2], Florian Hollfelder[4], and Zbynek Prokop[1,2]
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M236.h **3D PRINTING PROTEIN HYDROGEL CHIPS**
Haiyang Jia and Petra Schwille
Max-Planck-Institute of Biochemistry, GERMANY

M237.h **LARGE-SCALE FABRICATION OF MICROFLUIDIC CHIPS WITH THREE-DIMENSIONAL MICROSTRUCTURES FOR POINT OF CARE APPLICATION**
Trieu Nguyen, Vinayaka Aaydha Chidambara, Dang Duong Bang, and Anders Wolff
Technical University of Denmark, DENMARK

M238.h **WET SPINNING OF A LOW MOLECULAR WEIGHT HYDROGEL TOWARDS 3D PRINTING**
Anaïs Chalard, Sandrine Assié-Souleille, Charline Blatché, Barbara Lonetti, Nathalie Saffon-Merceron, Isabelle Loubinoux, Laurence Vaysse, Laurent Malaquin, Juliette Fitremann, and Pierre Joseph
Université de Toulouse, FRANCE

T237.h **DEVELOPMENT OF CELL CULTURE MICRODEVICE USING GELATIN GEL**
Satoko Sasaki and Kae Sato
Japan Women's University, JAPAN

T238.h **MACRO VALVE AND PERISTALTIC PUMP WITH CLEANROOM-FREE FABRICATION FOR MULTIPLEXED ORGAN-ON-CHIP APPLICATIONS**
Elsbeth G.B.M. Bossink, Anke R. Vollertsen, Loes I. Segerink, and Mathieu Odijk
University of Twente, THE NETHERLANDS

T239.h **RAPID FABRICATION OF PMMA/PET-E/PMMA FOR THERMOPLASTIC MICROFLUIDIC MEMBRANE DEVICES**
Henrik Persson[1,2,3], Siwan Park[1], Michael Mohan[1], Edmond Young[1], and Craig A. Simmons[1,3]
[1]*University of Toronto, CANADA,* [2]*Lund University, SWEDEN, and* [3]*Ted Roger's Centre for Heart Research, CANADA*

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W237.h **3D BIOPRINTING OF ALGINATE HYDROGEL SCAFFOLDS USING FINE CALCIUM CHLORIDE MIST DROPLETS**
Ben MacCallum, Emad Naseri, Wyatt MacNevin, and Ali Ahmadi
University of Prince Edward Island, CANADA

W238.h **FABRICATION OF 3D-MICROSTRUCTURES USING A DMD-BASED TECHNOLOGY: PROOF OF CONCEPT AND APPLICATION**
Marie Camman[1,2], Catherine Villard[2], Audric Jan[2], Guillaume Laffite[2], Josselin Ruaudel[1], Olivier Lesage[2], and Matthieu Opitz[1]
[1]*Alvéole, FRANCE and* [2]*Université Paris Sciences et Lettres, FRANCE*

W239.h **MINIATURISING SUPERCRITICAL ANGLE FLUORESCENCE AND TOTAL INTERNAL REFLECTION FLUORESCENCE STRUCTURES FOR A MICROFLUIDIC SYSTEM USING IN DIAGNOSTIC APPLICATIONS**
Trieu Nguyen and Anders Wolff
Technical University of Denmark, DENMARK

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M239.h **SOFT ACTUATORS WITH PROGRAMMABLE MAGNETIC PARTICLES**
Heng-Yu Shen[1], Chih-Cheng Cheng[2], Tien-Kan Chung[2], and Yen-Wen Lu[1]
[1]*National Taiwan University, TAIWAN and*
[2]*National Chiao Tung University, TAIWAN*

W240.h **MICROFLUIDICS-BASED RANDOM NUMBER GENERATOR DRIVEN BY FINGER PUSH AND GRAVITY FORCE**
Korakot Boonyaphon[1], Shuichi Takayama[2], and Sung-Jin Kim[1]
[1]*Konkuk University, KOREA and* [2]*Georgia Institute of Technology, USA*

h – Late News

Sensors and Detection Technologies

M240.h **AN INTEGRATED GRAPHENE SENSOR FOR CLINICAL BIOMARKERS DETECTION IN A DIFFERENTIAL AND PORTABLE WAY**
Yunlu Pan, Cong Huang, Wenwen Shao, and Zhuang Hao
Harbin Institute of Technology, CHINA

M241.h **DEVELOPMENT OF AN RAPID DIAGNOSTIC TEST MICROFLUIDIC CHIP USING POLYCARBONATE FILM FOR MALARIA DETECTION**
Yong Tae Kim, Jihye Choi, and Heungsop Shin
Korea Polytechnic University, KOREA

M242.h **INTEGRATED SYSTEM USING A GAS PRECONCENTRATOR AND A COLORIMETRIC SENSOR ARRAY FOR EXHALED BREATH ANALYSIS**
Hye-Lim Kang[1], Sumi Yoon[1], Dong-Ki Hong[1], Won-Hye Kim[1], Woo Kyeong Seong[1], Hana Cho[1], Dong-Sik Shin[2], and Kook-Nyung Lee[1]
[1]*Korea Electronics Technology Institute, KOREA and*
[2]*Sookmyung Women's University, KOREA*

Sensors and Detection Technologies

M243.h **LIGHT-CONTROLLED COLLECTION-AND-RELEASE OF BIOMOLE-CULES BY AN ON-CHIP NANOSTRUCTURED DEVICE**
Vadim Krivitsky, Ella Borberg, Marina Basovich, Omri Heifler, and Fernando Patolsky
Tel Aviv University, ISRAEL

M244.h **MICROTITER PLATE VIABILITY ASSAY TO EXTEND RESULTS OF THERMAL SENSOR WITH DISINFECTANTS ETHANOL, PERACETIC ACID AND SODIUM HYPOCHLORITE**
Tobias Wieland, Jan K. Kotthaus, Michael Bergmann, and Gerald A. Urban
University of Freiburg, GERMANY

M245.h **MULTIPLEXED ELECTROCHEMICAL PLATFORM FOR SEPSIS DIAGNOSTICS**
Uroš Zupančič[1], Pawan Jolly[2], Pedro Estrela[1], Despina Moschou[1], and Donald E. Ingber[2,3]
[1]*University of Bath, UK,* [2]*Harvard University, USA, and* [3]*Boston Children's Hospital and Harvard Medical School, USA*

M246.h **PORTABLE FLOW CELL FOR DETECTION OF MULTIPLE MICROCHANNELS IN A SINGLE CHIP**
Sammer-ul Hassan and Xunli Zhang
University of Southampton, UK

M247.h **SPECIFIC DETECTION OF POINT-MUTATION-POSITION USING BIOLOGICAL NANOPORE**
Ping Liu, Keisuke Shimizu, and Ryuji Kawano
Tokyo University of Agriculture and Technology, JAPAN

T240.h **3D NANOPOROUS CARBON MICROELECTRODES WITH SPONGE-LIKE EDGE STRUCTURES FOR HEAVY METAL SENSING**
Jongmin Lee and Heungjoo Shin
Ulsan National Institute of Science and Technology (UNIST), KOREA

T241.h **ANTIBODY-FREE ASSAY FOR ELECTROCHEMICAL ß-LACTAM MONITORING**
H. Ceren Ates, Nils Schneider, Richard Bruch, Wilfried Weber, Gerald Urban, and Can Dincer
University of Freiburg, GERMANY

T242.h **EFFECT OF ADDITIONAL THIN LAYER ON CHEMICAL SWELLING-INDUCED COLOR CHANGE IN COLLOIDAL CRYSTAL-PDMS COMPOSITE**
Hyung-Kwan Chang, Hyojeong Kim, and Jungyul Park
Sogang University, KOREA

T243.h **INTEGRATING APTAMERS WITH PAPER-BASED MICROSCALE ANALYTICAL DEVICES FOR BIOMEDICAL MONITORING**
Meng Liu, Christy Liu, Yingfu Li, and John D. Brennan
McMaster University, CANADA

Sensors and Detection Technologies

T244.h **LIVE QUANTIFICATION OF CELL VIABILITY VIA NEUTRAL RED UPTAKE USING LENS-FREE IMAGING**
Brian J. Nablo[2], Jung-Joon Ahn[2], Kiran Bhadriraju[1], Jong Muk Lee[2], and Darwin Reyes[1]
[1]*National Institute of Standards and Technology (NIST), USA and* [2]*SOL Inc., KOREA*

T245.h **MICROWAVE RADARS FOR LABEL FREE SINGLE-CELL DETECTION IN REAL TIME SYNCHRONIZED WITH OPTICAL IMAGE**
Arda Secme, Hadi S. Pisheh, H. Dilara Uslu, and Selim Hanay
Bilkent University, TURKEY

T246.h **PASSIVE WIRELESS SENSING OF MICROTISSUE PROPERTIES**
Lei Dong[1,2], Mario M. Modena[1], and Andreas Hierlemann[1]
[1]*ETH Zürich, SWITZERLAND and* [2]*Southeast University, CHINA*

T247.h **REAL-TIME AND MULTIPLEXED IMPEDANCE MONITORING OF ADIPOGENIC DIFFERENTIATION**
Lianmei Jiang[1,2], Junjun Li[1], Jianmiao Liu[3], and Yong Chen[1]
[1]*École Normale Supérieure, FRANCE,* [2]*Macquarie University, AUSTRALIA, and* [3]*CNRS, FRANCE*

W241.h **WITHDRAWN**

W242.h **BPOD: WIRELESS DISSOLVED OXYGEN SENSOR-INTEGRATED PLATFORM TOWARDS BIOPROCESS MONITORING**
Justin M. Stine, Luke A. Beardslee, Rajendra M. Sathyam, William E. Bentley, and Reza Ghodssi
University of Maryland, USA

W243.h **INLAID MICROFLUIDICS FOR NUTRIENT MONITORING**
Sean C. Morgan, Edward A. Luy, and Vincent J. Sieben
Dalhousie University, CANADA

W244.h **LABEL-FREE DISCRIMINATION FOR CARCINOMA CELLS THROUGH IONIC CURRENT SIGNALS**
Kazumichi Yokota, Muneaki Hashimoto, Kazuaki Kajimoto, Masato Tanaka, and Masatoshi Kataoka
National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

W245.h **LOW-COST GLUCOSE SENSOR USING COMPACT DISC SUBSTRATES**
Nityanand Kumawat[1], Priyamvada Venugopalan[1], and Sunil Kumar[1,2]
[1]*New York University, Abu Dhabi, UAE and* [2]*New York University, USA*

W246.h **MULTIPLEX, LABEL-FREE QUANTIFICATION OF miRNA BY REFLECTIVE PHANTOM INTERFACE**
Giuliano Zanchetta, Thomas Carzaniga, Luka Vanjur, Luca Casiraghi, Tommaso Bellini, and Marco Buscaglia
Università degli Studi di Milano, ITALY

Sensors and Detection Technologies

W247.h **PLANT WATER POTENTIAL SENSOR USING NANO POROUS ANODIC ALUMINIUM OXIDE**
Sanghoon Han, Tae Woong Yun, and Junghoon Lee
Seoul National University, KOREA

W248.h **SENSITIVITY IMPROVEMENT OF ELECTROCHEMICAL IMMUNOASSAY USING MAGNETIC PARTICLES TO KEEP A BARE INDIUM TIN OXIDE (ITO) ELECTRODE**
Sunga Song, Young Joo Kim, Hye-Lim Kang, Sumi Yoon, Dong-Ki Hong, Won-Hyo Kim, Woo Kyeong Seong, and Kook-Nyung Lee
Korea Electrics Technology Institute, KOREA

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KEYNOTE SPEAKERS

Nicola Aceto
University of Basel, SWITZERLAND

Guillaume Charras
University College London, UK

Hang Lu
Georgia Institute of Technology, USA

Matthias Lutolf
EPFL, SWITZERLAND

Christine Mummery
Leiden University, THE NETHERLANDS

Viola Vogel
ETH Zurich, SWITZERLAND

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I

M225h	T225h	M229h	T229h	M235h	T235h	M241h	T241h	W245h	M246h
W224h	W225h	W228h	W229h	W234h	W235h	W240h	W241h	T245h	T246h
T224h	M226h	T228h	M230h	T234h	M236h	T240h	M242h	M245h	W246h
M224h	T226h	M228h	T230h	M234h	T236h	M240h	T242h	W244h	M247h
W223h			W230h	W233h	W236h	W239h	W242h		W247h
T223h	●	●	M231h	T233h	M237h	T239h	M243h	●	T247h
M223h			T231h	M233h	T237h	M239h	T243h		W248h
W222h	W226h	W227h	W231h	W232h	W237h	W238h	W243h	T244h	Job Board
T222h	M227h	T227h	M232h	T232h	M238h	T238h	M244h	Poster Info.	

H

M205g	T205g	M208g	T208g	M212h	T212h	M216h	T216h	M220h	T220h
T204g	W205g	W207g	W208g	W211h	W212h	W215h	W216h	T219h	W220h
M204g	M206g	T207g	M209g	T211h	M213h	T215h	M217h	M219h	T221h
		M207g	W209g	M211h	T213h	M215h	T217h	T218h	W221h
		W206g	T209g	T210h	W213h	W214h	W217h	W218h	M222h
		T206g	W210g	M210h	M214h	T214h	M218h		

G

W204f	M198f	W197f	M192f	W191f	M186f	W185f	M180f	W179f	M174f	W173f
T203f	T198f	T197f	T192f	T191f	T186f	T185f	T180f	T179f	T174f	T173f
W203f	W198f	M197f	W192f	M191f	W186f	M185f	W180f	M179f	W174f	M173f
M203f	M199f	W196f	M193f	W190f	M187f	W184f	M181f	W178f	M175f	W172f
W202f	T199f	T196f	T193f	T190f	T187f	T184f	T181f	M178f	W175f	M172f
T202f	W199f	M196f	W193f	M190f	W187f	M184f	W181f	W178f	M175f	W172f
M202f	M200f	W195f	M194f	W189f	M188f	W183f	M182f	W177f	M176f	W171f
W201f	T200f	T195f	T194f	T189f	T188f	T183f	T182f	T177f	T176f	T171f
T201f	W200f	M195f	W194f	M189f	W188f	M183f	W182f	M177f	W176f	M171f
M201f										

W137d	M138d	W143e	M144e	W149e	M150e	W155e	M156e	W161e	M162e	W167f	M168f
T137d	W138d	T143e	T144e	T149e	T150e	T155e	T156e	T161e	T162e	T167f	T168f
M137d	T138d	M143e	W144e	M149e	W150e	M155e	W156e	M161e	W162e	M167f	W168f
W136d	W139d	W142e	M145e	W148e	M151e	W154e	M157e	W160e	M163e	W166f	M169f
T136d	M139e	T142e	T145e	T148e	T151e	T154e	T157e	T160e	T163e	T166f	T169f
M136d	T139e	M142e	W145e	M148e	W151e	M154e	W157e	M160e	W163e	M166f	W169f
W135d	M140e	W141e	M146e	W147e	M152e	W153e	M158e	W159e	M164e	W165f	M170f
T135d	T140e	T141e	T146e	T147e	T152e	T153e	T158e	T159e	T164e	T165f	T170f
M135d	W140e	M141e	W146e	M147e	W152e	M153e	W158e	M159e	W164e	M165f	W170f

F

M134d	W133d	M132d	W131d	M130d	W129d	M128d	W127d	M126d	W125d	M124d	W123d	T122d	M122d
T134d	T133d	T132d	T131d	T130d	T129d	T128d	T127d	T126d	T125d	T124d	T123d	W122d	W121d
W134d	M133d	W132d	M131d	W130d	M129d	W128d	M127d	W126d	M125d	W124d	M123d		

HALL **4.1**
FIRST FLOOR

E

W107c	T107c	W102c	T102c	W096c	T096c	W090c	T090c	M086c	W085c
M108c	M107c	M103c	M102c	M097c	M096c	M091c	M090c	T086c	T085c
T108c	W106c	T103c	W101c	T097c	W095c	T091c		W086c	M085c
		W103c	T101c	W097c	T095c	W091c		M087c	W084c
	●	M104c	M101c	M098c	M095c	M092c	●	T087c	T084c
W108c	T106c	T104c	W100c	T098c	W094c	T092c		W087c	M084c
M109c	M106c	W104c	T100c	W098c	T094c	W092c	W089c	M088c	W083c
T109c	W105c	M105c	M100c	M099c	M094c	M093c	T089c	T088c	T083c
		T105c	W099c	T099c	W093c	T093c	M089c	W088c	M083c

W109c	T115d	W115d	T121d
M110c	M115d	M116d	M121d
T110c	W114d	T116d	W120d
W110c	T114d	W116d	T120d
M111d	M114d	M117d	M120d
T111d	W113d	T117d	W119d
W111d	T113d	W117d	T119d
M112d	M113d	M118d	M119d
T112d	W112d	T118d	W118d

MONDAY	TUESDAY	WEDNESDAY
14:00 - 16:30	14:00 - 16:30	14:15 - 16:45

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
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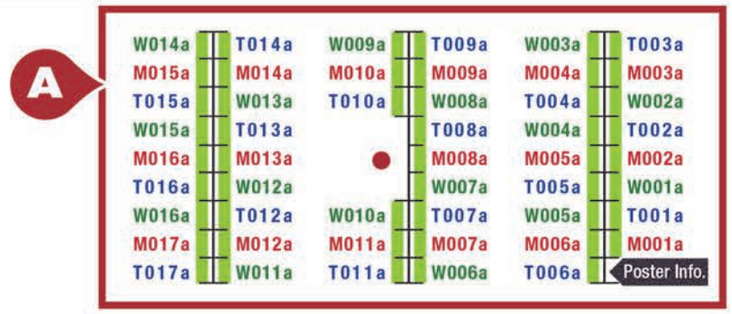

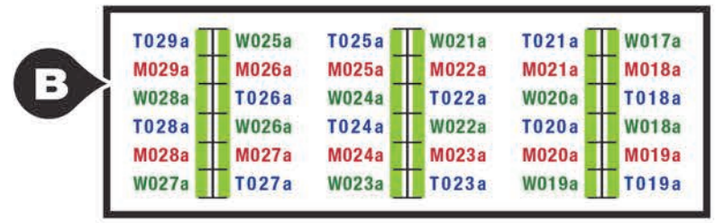

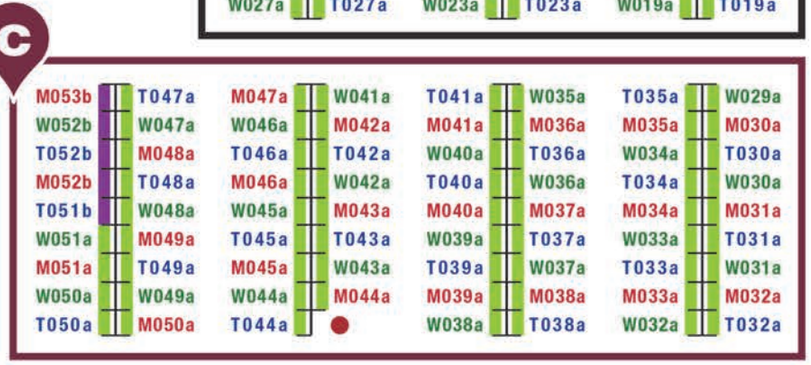

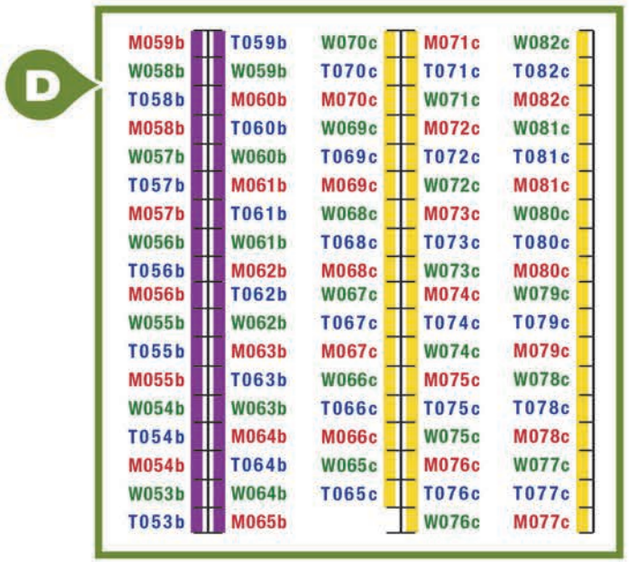

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