at the

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TECHNICAL PROGRAM

All indicated times in the program are Pacific Daylight Time (PDT)

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Conference Chairs

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Joel Voldman
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Monday, 11 October	07:30 - 17:15	Thursday, 14 October	08:00 - 11:50
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contact@miroculus.com miroculus.com

Miroculus are on a mission to advance science and improve lives faster, together. Our vision is to make the most complex protocols easy and accessible to scientists everywhere. We have developed a novel digital microfluidics technology to automate and miniaturize genomic protocols such as NGS library prep, synthetic biology, cell editing, and combinatorial chemistry, in a compact, user-friendly system. This electrowetting technology is distinct from microchannel-based fluidics as it enables precise control of reagents without the need for complex channels, microvalves, or pumps. To find out more about the benefits of our systems and how our technology is transforming many different applications visit our website.

Precigenome LLC ..... tabletop

2176 Ringwood Avenue
San Jose, CA 95131 USA
phone: +1-408-708-4602
info@precigenome.com www.precigenome.com

PreciGenome's innovative microfluidic pressure/flow controller and high speed imaging system are useful basic tools for a variety of applications and system integration. Combined with valves, tubing and fitting, reservoir kits, and microfluidic chips, we successfully demonstrated perfusion systems (multiple reagent dispensing or media recirculating perfusion), droplet generation systems, single cell encapsulation systems, nanoparticle synthesis systems, and organ-on-a-chip systems,etc. The microfluidic pressure controller provides pulse-free precise positive and negative pressure. Stable constant flow rates can be set and controlled when used in conjunction with external liquid flow sensors. PreciGenome also offers custom design and OEM solutions for customers who need microfluidic instrument development and production.

Exhibitor **Booth**

Quantum Design Inc. 16
10307 Pacific Center Court
San Diego, CA 92121 USA
phone: 1-858-481-4400
info@qdusa.com www.qdusa.com

Quantum Design (QD) manufacturers and distributes industry leading scientific products. It manufactures a novel tool for correlative microscopy (AFSEM), where users can perform various modes of atomic force microscopy inside scanning electron microscopes. QD distributes instruments such as: compact direct write sub-micron lithography systems (MicroWriter) which is available in four different affordable models; a stand-alone 3D printing system (Ceres); and Optical Tweezers (Tweez). The Ceres system prints complex and pure metal objects at micrometer scale, with sub micrometer resolution. The "Tweez" Optical Tweezers enable optical manipulation ideally suited for research in cell biology, biophysics, and genetics.

RAN Biotechnologies, Inc. 24
100 Cummings Center, Suite 434J
Beverly, MA 01915 USA
phone: 1-833-726-2661
info@ranbiotechnologies.com www.ranbiotechnologies.com

RAN Biotechnologies supplies smart materials for next generation science. They include: - Fluorosurfactants: RAN Biotech's gold standard and custom surfactants are used to stabilize water:oil interface and are mostly used in droplet microfluidics. - Hydrogel Beads: They are compressible, stable, monodisperse. Example custom mechanical, chemical and biological functionalities include barcoding, dissolvable and superparamagnetic beads. Their mechanical properties support their use in conventional microfluidics, wells and particle templated emulsion processes and can be adapted to custom workflows. - NextGen Affinity Resins that isolate and detect bacteria, fungi and viruses at the micro-scale as well as in bulk and continuous flow setups.

***Research*, a Science Partner Journal** ..... virtual
1200 New York Avenue, NW
Washington, DC 20005 USA
phone: 1-202-326-6417 spj.sciencemag.org/journals/research

Research, a Science Partner Journal is an Open Access publication distributed by the American Association for the Advancement of Science (AAAS) in association with Science and Technology Review Publishing House, the publishing house under the leadership of China Association for Science and Technology (CAST). *Research* provides an international platform for academic exchange, collaboration and technological advancements. The journal also aims to publish high-quality research from any research domain, from any author in the world.

Sensific GmbH ..... virtual
Kurze Lemppen 1
Ulm, 89075 GERMANY
phone: +49-731-50-23017
info@sensific.de www.sensific.de

Sensific offers imaging-based analysis and control systems for microfluidics. Our flagship product ODIN enhances your microscope or custom setup. It adds high-speed imaging with real-time analysis and control capabilities to your microfluidic experiment. Combine bright-field and multiple fluorescence channels in the analysis and sort droplets, cells, particles, bacteria, and algae according to your individual criteria. ODIN offers a user-friendly graphical user interface that enables you to perform complex analysis and sorting tasks.

Exhibitor **Booth**

STRATEC Consumables GmbH 26

Sonystraße 20
Anif, Salzburg, 5081 AUSTRIA
phone: +43-6246-21250
consumables@stratec.com www.stratec.com/solutions/consumables

STRATEC Consumables GmbH is a leading OEM supplier of smart polymer-based consumables to the in-vitro diagnostics, life sciences and medical technology industries. The company has a unique combination of skills and technologies including nano- and microstructuring, coating technologies, polymer sciences, and automated assembly. With its certified production facility and a global logistics network, STRATEC Consumables covers the entire value chain, from development via production and quality assurance through to logistics. The company meets all regulatory requirements in the relevant target markets. Its customers include global players in highly regulated markets as well as innovative start-ups.

Technicolor Precision BioDevices 5

3601 Calle Tecate Ste 120
Camarillo, CA 93012 USA
phone: 1-805-312-5319
microfluidics.info@technicolor.com microfluidics.technicolor.com

Technicolor Precision BioDevices provides world-class rapid prototyping and scalable manufacturing services of precision injection-molded microfluidic consumables to the life science industries. As specialists in microfluidics, biology and bioengineering, Technicolor provides innovative and customized solutions that fit your requirements for materials, optics, cost, quality and performance. Specialists in micro, nanoarrays, optical flow cells, droplet generators for single cell analysis, molecular diagnostics and genomics applications. Let us help you with a microfluidics solution!

TERA-print, LLC 4

8140 McCormick Blvd., Suite 132
Skokie, IL 60076 USA
phone: 1-224-534-7543
sales@teraprint.us www.tera-print.com

TERA-print is the first nanotechnology company in the world that develops and commercializes tools and services enabled by cantilever-free scanning probe lithography. This novel nanofabrication technology combines
high-throughput and sub-diffraction resolution with materials generality and maskless pattern design like no other, allowing researchers to rapidly prototype nanostructured patterns and functional devices right from their desktop. This in turn opens new possibilities in fields spanning from microfluidics and biosensing to cell biology and tissue engineering.

UpNano GmbH 31

Modecenterstrasse 22/D36
Vienna, 1030 AUSTRIA
phone: +43-1-890-1652
office@upnano.at https://www.upnano.at

UpNano is a young high-tech company where long-standing know-how in the field of 2-photon polymerization meets innovative thinking and novel technology. The NanoOne platform is the first high-resolution 3D-printing system that combines the precision of 2-photon polymerization with unmatched high throughput and thus enables new applications in the manufacturing of polymeric micro-components. NanoOne is the fastest high-resolution 3D-printing system on the market. It is based on multiphoton lithography and combines the precision of 2-photon polymerization with an unmatched throughput of up to 200mm³/h. This makes the system suitable not only for scientific research approaches but also industrial manufacturing.

Exhibitor **Booth**

z-microsystems 36
Dr.-Walter-Zumtobel-Straße 9
Dornbirn, 6850 AUSTRIA
phone: +43-5572-7272
sales@z-microsystems.com www.z-microsystems.com

z-microsystems® is a specialist for microfluidic consumables and lab-on-a-chip applications, from development to high volume production. It concentrates on moulded plastic parts for the medical industry from the initial fluidics development to prototype production (milling / laser), pilot forms, pilot injection moulding, series forms, series injection moulding, coating, bonding and finally packaging. z-microsystems® provides highest precision from the idea to high-volume production.

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Zurich Instruments is a manufacturer of test & measurement equipment for advanced research & development applications. The instruments use LabOne® control software that sets a benchmark for efficient instrumentation control and a good user experience. This progressive approach reduces the complexity of laboratory setups, removes sources of problems and supports new measurement strategies that accelerate the progress of research. Zurich Instruments' portfolio comprises lock-in amplifiers, arbitrary waveform generators, impedance analyzers, quantum computing control systems, phase-locked loops and boxcar averagers.

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Zygo Corporation is a leading global provider of comprehensive metrology solutions, precision optics, and electro-optical design and manufacturing services for the both research and production applications. ZYGO designs and manufactures some of the world's most advanced non-contact 3D measurement systems providing unmatched performance, versatility, reliability, and value.

INDUSTRIAL STAGE

Industrial Stage Presentations will be held in the Primrose A Ballroom and virtually.

Monday, 11 October

Industrial Stage 1a

11:50 - 12:10 **HOW TO TAKE ADVANTAGE OF MICROFLUIDICS FOR LIFE SCIENCE APPLICATIONS**

Alexis Rezgui

Fluigent, FRANCE

Discover how to take advantage of pressure-based flow control instrumentation in three different Life Science applications: Organ-O-A-Chip, Droplet & Particle Generation, Cell sorting. When working with living cells, stability, response time and pulseless flow are key parameters to control with accuracy. In this talk, you will see how pressure-based instrumentation can enhance your applications and experiments. In addition, you'll discover how microfluidic can be integrated in an instrument for single cell.

Industrial Stage 1b

12:10 - 12:30 **COVID AND BEYOND - MICROFLUIDICS FOR POINT-OF-CARE DIAGNOSTICS IN PANDEMIC TIMES**

Holger Becker, Ph.D.

microfluidic ChipShop GmbH, GERMANY

The COVID-19 pandemic has put a spotlight on the need for highly sensitive, highly specific rapid diagnostic tests. This presentation will highlights the technical requirements for a wide range of technological approaches and microfluidic solutions to this challenge. We will also share our lessons learned in the development process of such systems and discuss manufacturing aspects for volume production. A rapid transition from academic ideas to diagnostic products require a deep understanding of such processes.

Industrial Stage 1c

12:30 - 12:50 **ADVANCE WAFER-LEVEL PROCESSES FOR NEXT-GEN INTEGRATED MICROFLUIDICS**

Richard Redburn, BSEE

EV Group (EVG), USA

The COVID-19 pandemic has put a spotlight on the need for highly sensitive, highly specific rapid diagnostic tests. This presentation will highlights the technical requirements for a wide range of technological approaches and microfluidic solutions to this challenge. We will also share our lessons learned in the development process of such systems and discuss manufacturing aspects for volume production. A rapid transition from academic ideas to diagnostic products require a deep understanding of such processes.

INDUSTRIAL STAGE

Tuesday, 12 October

Industrial Stage 2a

12:00 - 12:20 **ON DEMAND MATERIALS FOR NEXT GENERATION SCIENCE**

Roger Nassar, Ph.D.
RAN Biotechnologies, USA

RAN Biotechnologies develops and supplies smart materials to address timely needs in next generation science. Broad knowledge in synthetic and materials chemistry coupled with extensive experience in biological applications position our products in the lead. This presentation discusses specialty materials that capture, encapsulate and barcode biology and showcases their use across a wide range of applications. These materials include: • Hydrogel Beads: They are compressible, stable, monodisperse. Example custom mechanical, chemical and biological functionalities include barcoding, dissolvable and superparamagnetic beads. Their mechanical properties support their use in conventional microfluidics, wells and particle templated emulsion processes and can be adapted to custom workflows. • Fluorosurfactants: RAN Biotech's gold standard and custom surfactants are used to stabilize water:oil interface and are mostly used in droplet microfluidics. • NextGen Affinity Resins that isolate and detect bacteria, fungi and viruses at the micro-scale as well as in bulk and continuous flow setups.

Industrial Stage 2b

12:20 - 12:40 **HIGH-SPEED ANALYSIS AND CONTROL OF MICROFLUIDICS BY COMBINED BRIGHTFIELD AND FLUORESCENT IMAGING**

Daniel Geiger
Sensific GmbH, GERMANY

We demonstrate how our novel combinatorial bright-field and fluorescence analysis and control system enables advanced microfluidic experiments. Images of the different contrast types are captured and analyzed in real-time at measurement rates of several thousand images per second. More than 30 properties of each of the different channels like size, position and intensity are automatically calculated. All parameters can be freely combined, even between different channels, and directly monitored in the graphical user-interface. This allows for example the examination of cells in droplets in bright-field in combination with the cell state in fluorescence. For instance, identification of the population of cells expressing a certain protein. Additionally, our system allows the precise control of microfluidic systems based on the measurement results, because of its ultra-low latency of only a few microseconds between actual image exposure and analysis result. Therefore manipulation steps like sorting are easily possible, enhancing experimental possibilities even further.

Industrial Stage 2c

12:40 - 13:00 **HOW TO CREATE A FLUIDIC SOLUTION WITH MICROPUMP**

Frank Bartels
Bartels Mikrotechnik GmbH, GERMANY

Microfluidic systems are widely used in life sciences, such as diagnostics, drug delivery liquid and cell handling. The targeted fluidic functionality normally need a combination of different elements. This is often a pumping component, which is combined with elements like flow regulater, flow-sensor. pressure-sensor tubing. The combination of such elements can be tricky because of gas bubbles, insignificant sucking pressure or cavitation. In addition the different elements normally use individual driver and need a control software to establish the necessary functionality. We have put together a setup of reasonable, industrialized fluidic elements and tested the functionality under different various condition. This forward integration offers a fast and easy access to active microfluidcs and its high functionality brings users very close to their solution and realizes their vision.

INDUSTRIAL STAGE

Wednesday, 13 October

Industrial Stage 3a

11:50 - 12:10 **HOW TO MAKE SMART USE OF MULTI-MATERIAL OPTIONS IN MICROFLUIDIC CONSUMABLES**

Marko Blom

Micronit BV, NETHERLANDS

Being able to choose the right material early on in your development process is one of the key factors in the current microfluidics market. At Micronit, a 20+ years generalist in microfluidics, we know how to design and manufacture devices in polymers as well as glass and silicon in our fully ISO 13485 certified facilities. In addition, we have implemented wafer-scale and die-level hybrid assembly technologies in order to combine the right materials in the right manner. With our fluidics design expertise and our hybrid assembly capabilities, we can supply complete consumables for the Diagnostics market, but also for other applications such as Next Generation Sequencing or Single Cell Analysis. Marko Blom will discuss the basic principles of our multi-material and hybrid assembly approach and show you the benefits that can be achieved by going hybrid!

Industrial Stage 3b

12:10 - 12:30 **MICROFLUIDICS - CHANGING THE GAME IN BIOMARKER DETECTION**

Magdalena Schimke

STRATEC Consumables GmbH, AUSTRIA

Finding existing and novel biomarkers in circulating fluids via liquid biopsies is a strongly emerging field in research and technology development. It aims on finding extremely rare molecules, cells or sub-cellular compartments in body fluids that allow a diagnose of a disease, its progress and monitoring of therapy success. STRATEC here presents examples of novel technologies, relevant regulatory aspects, ways to make them accessible for the medical market as well as future perspectives.

Industrial Stage 3c

12:30 - 12:50 **HOW TO AUTOMATE YOUR SAMPLE PREPARATION USING SOUND**

Julia Alsved

AcouSort, SWEDEN

AcouSort provides products and solutions for automated preparation of biological samples for researchers and life science companies. The core technology is acoustofluidics where a combination of microfluidics and sound waves is used to separate blood into its components, to isolate and purify cells and to allow for in-line optical access to blood plasma in whole blood.

Sunday, 10 October

All indicated times are US Pacific Daylight Times (PDT).

Workshop Time Slot 1 - 09:30 - 10:30

Workshop 1: TISSUE AND ORGAN-ON-CHIP MICROSYSTEMS

Stephanie Descroix, *Institut Curie, FRANCE*
Megan McCain, *University of Southern California, USA*
Elena Martínez Fraiz, *Institute for Bioengineering of Catalonia, SPAIN*
Roisin Owens, *University of Cambridge, UK*

Workshop 2: TECHNOLOGIES FOR GLOBAL HEALTH AND RESOURCE-POOR SETTINGS

John Connelly, *Global Health Labs, USA*
Kevin Nichols, *Amazon Diagnostics, USA*
Rebecca Richards-Kortum, *Rice University, USA*
Bhushan Toley, *Indian Institute of Science, INDIA*

Workshop 3: LIQUID BIOPSIES

Valérie Taly, Université de Paris, FRANCE
Yong Zeng, University of Florida, USA

Workshop Time Slot 2 – 11:00 - 12:00

Workshop 4: ARTIFICIAL AND ENGINEERED CELL SYSTEMS

Katherine Elvira, *University of Victoria, CANADA*
Victor Ugaz, *Texas A&M University, USA*

Workshop 5: SINGLE-CELL DATA ANALYTICS

Federica Caselli, *University of Rome Tor Vergata, ITALY*
Bo Wang, *Stanford University, USA*
Carlos Honrado, *University of Virginia, USA*

Workshop 6: OPEN SPACE MICROFLUIDICS

Lead Presenter: Govind Kaigala, *IBM - Zurich, SWITZERLAND*
Iago Pereiro, *IBM - Research Zürich, SWITZERLAND*
Lead Presenter: Thomas Gervais, *Polytechnique Montréal, CANADA*
Étienne Boulais, *Polytechnique Montréal, CANADA*
Pierre-Alexandre Goyette, *Polytechnique Montréal, CANADA*
Lead Presenter: Ashleigh Theberge, *University of Washington*
Jian Wei Khor, *University of Washington*
Ulri Lee, *University of Washington*
Tammi van Neel, *University of Washington*
Yuting Zeng, *University of Washington*

Workshop Time Slot 3 – 15:30 - 16:30

Workshop 7: MACHINE LEARNING FOR MICROFLUIDIC DESIGN AND AUTOMATION
Junchao Wang, *Hangzhou Dianzi University, CHINA*
Yoonjin Won, *University of California, Irvine, USA*
Tsung-Yi Ho, *National Tsing Hua University, TAIWAN*

Workshop 8: MICROFLUIDICS FOR MICROBIOTA ANALYSIS
James Boedicker, *University of Southern California, USA*
Hyun Jung Kim, *University of Texas, Austin, USA*

Workshop 9: MICROFLUIDIC SYSTEMS INTEGRATION
Adrian Nightingale, *University of Southampton, UK*
Yuan Hao, *Southwest Jiaotong University, CHINA*
Chien-Fu Chen, *National Taiwan University, TAIWAN*

Workshop Time Slot 4 – 17:00 - 18:00

Workshop 10: MICROFLUIDICS FOR IMMUNOLOGY
Qasem Ramadan, *Alfaisal University, SAUDI ARABIA*
Cherie Stabler, *University of Florida, USA*
Esak (Isaac) Lee, *Cornell University, USA*

Workshop 11: SENSOR INTEGRATION FOR MICROSYSTEMS
Ashley Ross, *University of Cincinnati, USA*
Katsuo Kurabayashi, *University of Michigan, USA*
Kosuke Ino, *Tohoku University, JAPAN*

Workshop 12: MICROFLUIDIC FLOW VISUALIZATION
Chih-Yung Huang, *National Tsing Hua University, TAIWAN*
Yasuhiro Egami, *Aichi Institute of Technology, JAPAN*
Yu Matsuda, *Waseda University, JAPAN*

Workshop 13: 3D PRINTING FOR MICROFLUIDICS AND OPEN-SOURCE DEVICES
Yi-Chin Toh, *Queensland University of Technology, AUSTRALIA*
Noah Malmstadt, *University of Southern California, USA*
Greg Nordin, *Brigham Young University, USA*

18:00 - 20:00 Conference Registration and Check-In

18:00 - 20:00 Wine and Cheese Reception

Monday, 11 October

All indicated times are US Pacific Daylight Times (PDT).
The third character in the session code (i.e. M1**A) indicates which room the session will be.**
A – Palm Springs Convention Center, Primrose B Ballroom
B – Virtual Room, Conference Platform
C – Virtual Room, Conference Platform

M1A - Opening Remarks
Primrose Ballroom B - In-Person/Virtual

08:30 - 09:00 MicroTAS 2021 Conference Chairs
Amy E. Herr, *University of California, Berkeley, USA*
Joel Voldman, *Massachusetts Institute of Technology, USA*

M1A - Plenary Presentation I
Virtual
Session Chair: Amy Herr, University of California, Berkeley, USA

09:00 - 09:45

M1APL-1 DIAGNOSTICS FROM BENCH TO BEDSIDE: INNOVATION TO DRIVE IMPACT
Rosanna Peeling
London School of Hygiene and Tropical Medicine, UK

Speaker Corner

09:45 - 10:15 Rosanna Peeling – Virtual

09:45 - 10:15 Break and Exhibit Inspection

Session M1A1 - Organ-on-a-Chip I
Primrose Ballroom B - In-Person/Virtual
Session Chair: Ryan Sochol, University of Maryland, College Park, USA

10:15 - 10:35

M1A1-1 A 96-WELL-BASED MICROFLUIDIC PLATFORM FOR HIGH-THROUGHPUT CAPTURE AND ANALYSIS OF LIVE INTACT TUMOR "CUBOIDS"
Ethan J. Lockhart[1], Lisa F. Horowitz[1], Adán D. Rodríguez[1], Cb Lim[2], Tran Nguyen[1], Mehdi Mehrabi[3], Taranjit S. Gujral[2], and Albert Folch[1]
[1]University of Washington, USA, [2]Fred Hutchinson Cancer Research Center, USA, and [3]University of Pretoria, SOUTH AFRICA

10:35 - 10:55

M1A1-2 LINEAR MICROPATTERNED EPITHELIAL MODEL TO STUDY MIGRATORY EFFECTS OF INTERCELLULAR FORCE TRANSFER
Liam P. Dow, Reagan Kennedy, and Beth L. Pruitt
University of California, Santa Barbara, USA

10:55 - 11:15

M1A1-3 **A FULLY PATTERNED HUMAN NEURAL TUBE MODEL**
Xufeng Xue, Robin Yan, and Jianping Fu
University of Michigan, Ann Arbor, USA

11:15 - 11:35

M1A1-4 **A MYOCARDIAL INFARCT BORDER-ZONE-ON-A-CHIP DEMONSTRATES AN OXYGEN GRADIENT REGULATES CARDIAC TISSUE FUNCTION**
Megan L. Rexius-Hall[1], Natalie N. Khalil[1], Xin Li[2], Jiayi Hu[2], Hongyan Yuan[2], Sean Escopete[3], Sarah J. Parker[3], and Megan L. McCain[1]
[1]University of Southern California, USA, [2]Southern University of Science and Technology, CHINA, and [3]Cedars-Sinai Medical Center, USA

Session M1B1 - Measurement and Metrology
Virtual
Session Chair: Petra Dittrich, ETH Zürich, SWITZERLAND

10:15 - 10:35

M1B1-1 **PEPS: AN INNOVATIVE MICROFLUIDIC DEVICE FOR BEDSIDE WHOLE BLOOD PROCESSING BEFORE PLASMA PROTEOMICS ANALYSES**
Benoit Gilquin, Myriam Cubizolles, Remco Den Dulk, Frédéric Revol-Cavalier, Manuel Alessio, Charles-Elie Goujon, Camille Echampard, Gorka Arrizabalaga, Annie Adrait, Mathilde Louwagie, Patricia Laurent, Fabrice P. Navarro, Yohann Couté, Marie-Line Cosnier, and Virginie Brun
University Grenoble Alpes, FRANCE

10:35 - 10:55

M1B1-2 **SUSPENDED NANOCHANNEL RESONATOR ARRAYS WITH PIEZORESISTIVE READOUT FOR HIGH-THROUGHPUT WEIGHING OF NANOPARTICLES**
Marco Gagino[1,2], Georgios Katsikis[1], Selim Olcum[1], Scott R. Manalis[1], and Vincent Agache[1,2]
[1]Massachusetts Institute of Technology, USA and [2]CEA/LETI, Université Grenoble Alpes, FRANCE

10:55 - 11:15

M1B1-3 **KÁRMÁN VORTEX CITY OF DNA STRANDS**
Oskar E. Ström, Jason P. Beech, and Jonas O. Tegenfeldt
Lund Univeristy, SWEDEN

11:15 - 11:35

M1B1-4 **DEEP LEARNING BASED SIGNAL RESTORATION ENABLES HIGH-SPEED AND LONG-TERM FLUORESCENT IMAGING IN MICROFLUIDICS**
Shivesh Chaudhary, Sihoon Moon, and Hang Lu
Georgia Institute of Technology, USA

Session M1C1 - Organ-on-a-Chip II
Virtual
Session Chair: Séverine Le Gac, University of Twente, NETHERLANDS

10:15 - 10:35

M1C1-1 **BIOELECTRONIC INTERSTITIUM-ON-CHIP ENABLES METASTATIC MONITORING**
Janire Saez, Mate Varga, Aimee Withers, Francesca Melle, David Fairen-Jimenez, and Róisin M. Owens
University of Cambridge, UK

Center of BioModular Multiscale Systems for Precision Medicine

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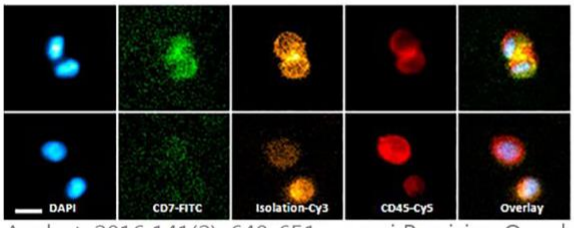
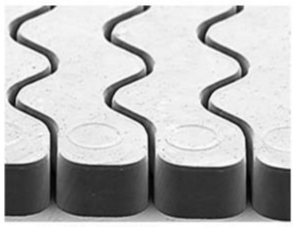


Analyst. 2016 141(2): 640-651



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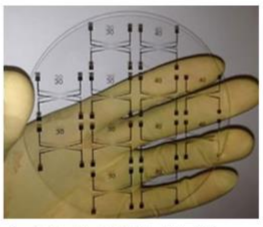
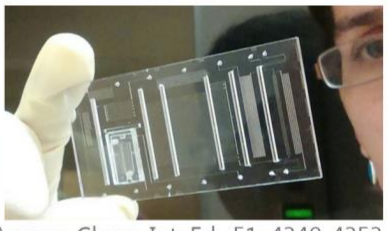


Integ. Biol., 10, 2, 2018, 82-91



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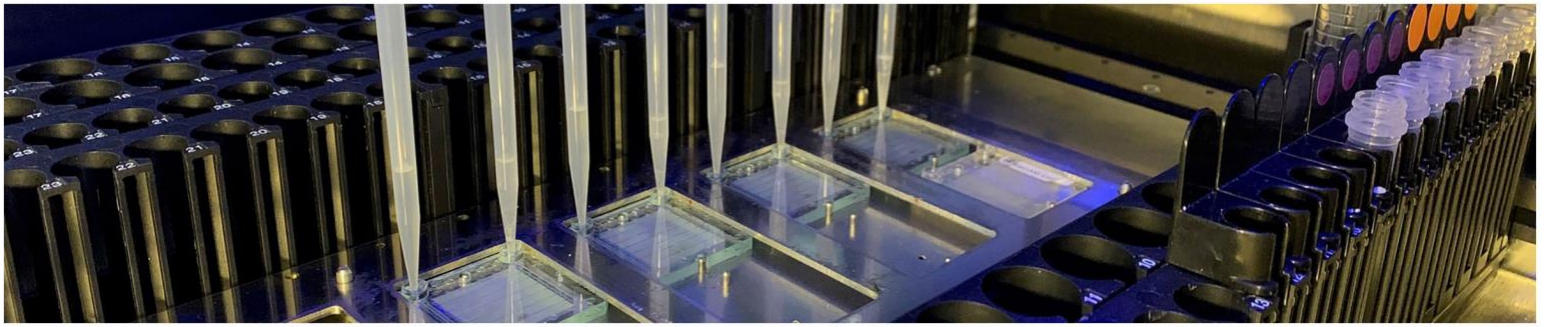

10:35 - 10:55

M1C1-2 **A GUT ON CHIP MODEL FOR THE STUDY OF EPITHELIAL CELL/FIBROBLAST INTERACTIONS**
Marine Verhulsel, Anthony Simon, Moencopi Bernheim-Dennery, Venkata Ram Gannavarapu, Lauriane Gérémie, Davide Ferraro, Denis Krndija, Jean-Louis Viovy, Danijela Matic Vignjevic, and Stéphanie Descroix
Institut Curie, FRANCE

10:55 - 11:15

M1C1-3 **AN ORGANOTYPIC INTESTINAL TISSUE-ON-A-CHIP SYSTEM FOR MODELING INNATE IMMUNE RESPONSE TO PARASITE INFECTION**
Mouhita Humayun, Keon Young Park, Jose M. Ayuso, Laura J. Knoll, Sheena Kerr, and David J. Beebe
University of Wisconsin, USA

11:15 - 11:35

M1C1-4 **ROLE OF ARYL HYDROCARBON RECEPTOR EXPRESSION IN CANCER CELL INVASION USING THREE-DIMENSIONAL MICROFLUIDIC INVASION ASSAYS**
Erica Y. Scott[1], Bingyu B. Li[1], Jason Matthews[2], and Aaron R. Wheeler[1]
[1]University of Toronto, CANADA and [2]University of Oslo, NORWAY

11:35 - 13:30 Lunch and Guided Mixer

M1A - Industrial Stage 1
Virtual
Session Chair: Aaron Streets, University of California, Berkeley, USA

11:50 - 12:10 1a - Fluigent
HOW TO TAKE ADVANTAGE OF MICROFLUIDICS FOR LIFE SCIENCE APPLICATIONS

12:10 - 12:30 1b - microfluidic ChipShop GmbH
COVID AND BEYOND – MICROFLUIDICS FOR POINT-OF-CARE DIAGNOSTICS IN PANDEMIC TIMES

12:30 - 12:50 1c - EV Group (EVG)
ADVANCE WAFER-LEVEL PROCESSES FOR NEXT-GEN INTEGRATED MICROFLUIDICS

Session M1A2 – Mechanotransduction
Primrose Ballroom B - In-Person/Virtual
Session Chair: Jongyoon Han, Massachusetts Institute of Technology, USA

13:30 - 13:50

M1A2-1 **ENGINEERING SKELETAL MUSCLE TISSUES FOR ADVANCED SYNAPSE FORMATION WITH HUMAN INDUCED PLURIPOTENT STEM CELL-DERIVED MOTOR NEURONS**
Jeffrey W. Santoso, Xiling Li, Divya Gupta, Gio C. Suh, Eric Hendricks, Shaoyu Lin, Sarah Perry, Justin K. Ichida, Dion Dickman, and Megan L. McCain
University of Southern California, USA

13:50 - 14:10

M1A2-2 **COUPLING OF NOVEL, AGE-RELATED FUNCTIONAL DECLINES AND GENE EXPRESSION PATTERNS IN MECHANOSENSATION ENABLED BY MICROFLUIDIC DELIVERY OF ROBUST, PRECISE STIMULI**

Jason Wan, Jimmy Ding, and Hang Lu
Georgia Institute of Technology, USA

14:10 - 14:30

M1A2-3 **THE PRINCESS AND THE PEA: MEASURING CYTOSKELETAL RESPONSE TO STIFFNESS WITH HYBRID ON-CHIP CULTURE DEVICE**

Louise L. Hansen and Amy E. Herr
University of California, Berkeley, USA

Session M1B2 – Oncology
Virtual

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

13:30 - 13:50

M1B2-1 **A 3D CANCER-BIOFILM MICROFLUIDIC MODEL FOR DISEASE MODELLING AND DRUG SCREENING**

Yanlin Deng[1], Song Lin Chua[2], and Bee Luan Khoo[1]
[1]City University of Hong Kong, HONG KONG and [2]Hong Kong Polytechnic University, HONG KONG

13:50 - 14:10

M1B2-2 **DRUG TESTING OF MICRO-DISSECTED CANCER "CUBOIDS" USING A MICROFLUIDIC DEVICE**

Lisa F Horowitz[1], Adán D. Rodriguez[1], Cb Lim[2], Tran Ngyuen[1], Ethan Lockhart[1], Mehdi Mehrabi[3], Taranjit S. Gujral[2], and Albert Folch[1]
[1]University of Washington, Seattle, USA, [2]Fred Hutchinson Cancer Research Center, USA, and [3]University of Pretoria, SOUTH AFRICA

14:10 - 14:30

M1B2-3 **DIRECT DETECTION OF DNA METHYLATION AND DEMETHYLATION INTERMEDIATES USING BIOLOGICAL NANOPORE**

Ping Liu and Ryuji Kawano
Tokyo University of Agriculture and Technology, JAPAN

Session M1C2 - Organ-on-a-Chip III
Virtual

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

13:30 - 13:50

M1C2-1 **FREESTANDING, MULTILAYERED AND BIOMIMETIC VASCULATURE-ON-A-CHIP MODEL BY 3D-PRINTED POROUS MOLD**

Terry Ching[1,2], Jyothsna Vasudevan[1,2], Shu-Yung Chang[1], Hsih Yin Tan[2], Chwee Teck Lim[2], Javier G. Fernandez[1], Jun Jie Ng[2], Yi-Chin Toh[3], and Michinao Hashimoto[1]
[1]Singapore University of Technology and Design, SINGAPORE, [2]National University of Singapore, SINGAPORE, and [3]Queensland University of Technology, AUSTRALIA

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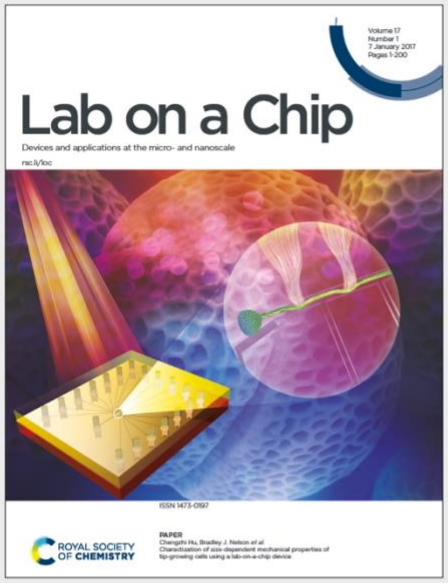

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13:50 - 14:10

M1C2-2 **REVERSE-ENGINEERING THE INTERSECTION BETWEEN CANCER, IMMUNOTHERAPY AND HIV**
Jose M. Ayuso, Mehtab Farooqui, Kathryn Denecke, Maria Virumbrales-Munoz, Sheena Kerr, Jorge Guerrero, Nathan Sherer, Melissa C. Skala, and David J. Beebe
University of Wisconsin, USA

14:10 - 14:30

M1C2-3 **CANCER ORGANOTROPISM-ON-A-CHIP**
Molly Shen, Alia Alameri, Andrew Tan, Emilie Solymoss, Grant Ongo, Sébastien Tabariès, Andy Ng, Peter M. Siegel, David Juncker
McGill University, CANADA

14:30 - 14:45 Transition

M1A - Plenary Presentation II
Virtual
Session Chair: Abe Lee, University of California, Irvine, USA

14:45 - 15:30

M1APL-2 **ORGANOIDS MEET ORGAN CHIPS**
Jianhua Qin
Chinese Academy of Sciences (CAS), CHINA

Speaker Corner

15:30 - 16:00 Jianhua Qin - Virtual

15:30 - 15:45 Transition

Poster Spotlight Presentations
Virtual

15:45 - 16:15 Spotlight Presentations from Poster Session M1A - M1B - M1C
You may download a complete list of poster spotlight presentations from the website.

Poster Sessions M1A, M1B, and M1C
Gather.Town

16:15 - 17:15 Presentations are listed by topic category with their assigned number starting on page 58.

16:45 - 17:15 Break and Exhibit Inspection

Session M1A3 - Manipulation of Solids
Primrose Ballroom B - In-Person/Virtual
Session Chair: Stephen Jacobson, Indiana University, USA

17:15 - 17:35

M1A3-1 **HYDRODYNAMIC CELL SPLITTER: A MICROFLUIDIC TOOL TO STUDY SINGLE-CELL WOUND HEALING AND REGENERATION**
Rajorshi Paul, Kevin S. Zhang, Nicolas Castaño, and Sindy K.Y. Tang
Stanford University, USA

17:35 - 17:55

M1A3-2 **SCALABLE BACTERIAL ELECTROPORATION ENABLED BY A LOW COST, FABRICATION-FREE, DISPOSABLE MICROFLUIDIC DEVICE**
Po-Hsun Huang, Sijie Chen, and Cullen R. Buie
Massachusetts Institute of Technology, USA

17:55 - 18:15

M1A3-3 **MICROMACHINES DRIVEN BY OPTOELECTRONIC TWEEZERS**
Mohamed Elsayed, Shuailong Zhang, and Aaron R. Wheeler
University of Toronto, CANADA

Session M1B3 - Manipulation of Fluids
Virtual
Session Chair: Yanyi Huang, Peking University, CHINA

17:15 - 17:35

M1B3-1 **SHEAR-MEDIATED MEMBRANE DEFORMATION FOR PROTEIN ENCAPSULATION IN ERYTHROCYTES**
Md Habibur Rahman, Chung Hong N. Wong, Marianne M. Lee,
Michael K. Chan, and Yi-Ping Ho
Chinese University of Hong Kong, HONG KONG

17:35 - 17:55

M1B3-2 **ON-CHIP INTEGRATION OF BIOLOGICAL SAMPLE BUFFER SWAP WITH DOWNSTREAM DIELECTROPHORETIC SEPARATION**
XuHai Huang, Karina Torres-Castro, Walter Varhue, Aditya Rane, Ahmed Rasin, and Nathan S. Swami
University of Virginia, USA

17:55 - 18:15

M1B3-3 **A HIGH-THROUGHPUT NANOFLUIDIC DEVICE FOR EXOSOME LOADING**
Rui Hao[1,2], Zitong Yu[1], Jing Du[1], Shi Hu[1], Hang Guo[2], Yi Zhang[3], and Hui Yang[1]
[1]Chinese Academy of Sciences (CAS), CHINA, [2]Xiamen University, CHINA, and
[3]Shenzhen Institute of Advanced Technology, CHINA

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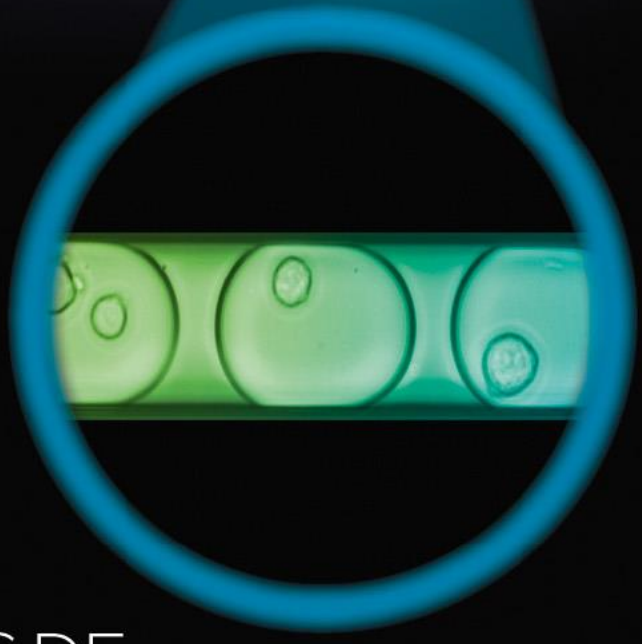

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Session M1C3 - Droplets and Mass Spectrometry
Virtual

Session Chair: Jungyul Park, Sogang University, KOREA

17:15 - 17:35

M1C3-1 **INTEGRATED SILICON CHIP ENABLING GENERATION AND ELECTRO-SPRAY OF PICOLITER DROPLETS FOR MASS-SPECTROMETRY ANALYSIS**

Yan Zhang, Yaoyao Zhao, Weihua Shi, Hrishikesh Iyer, Sungho Kim, Christopher Brenden, Insu Park, Stanislav Rubakhin, Rashid Bashir, Jonathan Sweedler, and Yurii Vlasov
University of Illinois, Urbana-Champaign, USA

17:35 - 17:55

M1C3-2 **SILICON MICROFLUIDIC CHIP FOR GENERATION AND ELECTRO-DEPOSITION OF PICOLITER DROPLETS FOR MASS SPECTROMETRY**

Weihua Shi, Sara Bell, Yan Zhang, Sungho Kim, Hrishikesh Iyer, Chris Kenji Brenden, Insu Park, Rashid Bashir, Jonathan Sweedler, and Yurii Vlasov
University of Illinois, Urbana-Champaign, USA

17:55 - 18:15

M1C3-3 **HIGH-SENSITIVITY DETECTION BY AN INTERFACE OF MASS SPECTROMETRY UTILIZING FEMTOLITER-DROPLET NANOFLUIDICS**

Yutaka Kazoe[1], Yuto Takagi[2], Kyojiro Morikawa[2], and Takehiko Kitamori[2,3]
[1]Keio University, JAPAN, [2]University of Tokyo, JAPAN, and [3]National Tsing Hua University, TAIWAN

18:15 Adjourn for the Day

18:15 - 19:45 MicroTAS Student Mixer

Tuesday, 12 October

All indicated times are US Pacific Daylight Times (PDT).

08:15 - 08:30 Announcements

T2A - Analytical Chemistry - Young Innovator Award Presentation
Virtual

08:30 - 08:50 **ELECTROKINETIC ENRICHMENT OF TARGETED CELLS AND NUCLEIC ACIDS COUPLED WITH ELECTROCHEMICAL SENSING FOR POINT-OF-CARE DIAGNOSTICS**
Robbyn K. Anand
Iowa State University, USA

08:50 - 09:05 Transition

Poster Sessions T2A, T2B, and T2C
Gather.Town

09:05 - 10:05 Presentations are listed by topic category with their assigned number starting on page 58.

09:50 - 10:20 Break and Exhibit Inspection

Session T2A1 - Fast, Scalable Systems
Primrose Ballroom B - In-Person/Virtual
Session Chair: Charles Henry, Colorado State University, USA

10:20 - 10:50

Keynote Presentation

T2A1-1 **ACOUSTOFLUIDICS AT THE MICRO TO NANO SCALE**
James Friend
University of California, San Diego, USA

10:50 - 11:10

T2A1-2 **LABEL-FREE INERTIAL-FERROHYDRODYNAMIC CELL SEPARATION WITH HIGH THROUGHPUT AND RESOLUTION**
Yang Liu, Wujun Zhao, and Leidong Mao
University of Georgia, USA

11:10 - 11:30

T2A1-3 **REENVISIONED 3D PRINTING AS AN ENABLER FOR EXTREME MICROFLUIDIC COMPONENT MINIATURIZATION AND INTEGRATION**
Gregory P. Nordin, Jose L. Sanchez Noriega, Jonard Corpuz Valdoz, Nicholas A. Chartrand, Matthew S. Viglione, Adam T. Woolley, Pam M. Van Ry, and Kenneth A. Christensen
Brigham Young University, USA

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11:30 - 11:50

T2A1-4 **A RAPID MAGNETOPHORETIC BASOPHIL ISOLATION DEVICE FOR ALLERGIC DISEASE APPLICATIONS**
Nicolas Castaño, Adrian M. Martin, Stephen J. Galli, Kari Nadeau, and Sindy K.Y. Tang
Stanford University, USA

Session T2B1 - Biomolecular Assays I
Virtual
Session Chair: Trieu Nguyen, California Northstate University, College of Pharmacy, USA

10:20 - 10:50

Keynote Presentation

T2B1-1 **EFFICIENT FLUIDIC DESIGN SYNERGISTICALLY EMPOWERED BY A DIGITAL TWIN STRATEGY AND BLOCKCHAIN-BASED CROWDSOURCING**
Jens Ducrée
Dublin City University (DCU), IRELAND

10:50 - 11:10

T2B1-2 **EFFICIENT SENSING OF SINGLE VIRUSES AND NANOPARTICLES BY NANOMECHANICAL SENSORS INTEGRATED WITH ION LENSES**
R. Tufan Erdogan[1], Mohammed Alkhaled[1], Batuhan E. Kaynak[1], Hashim Alhmoud[1], Hadi S. Pisheh[1], Mehmet Kelleci[1], Ilbey Karakurt[1], Cenk Yanik[2], Z. Betul Sen[1], A. Murat Yagci[3], Aykut Ozkul[4], and M. Selim Hanay[1]
[1]Bilkent University, TURKEY, [2]Sabanci University, TURKEY, [3]Middle East Technical University, TURKEY, and [4]Ankara University, TURKEY

11:10 - 11:30

T2B1-3 **IN SITU HYDROGEL POLYMERIZATION IN MICROFLUIDICS FOR ONE-STEP COMPETITIVE ASSAYS**
Marco Rocca[1,2], Maxime Dufresne[1], Marie L. Salva[1,2], Christof M. Niemeyer[2], and Emmanuel Delamarche[1]
[1]IBM Research Europe, SWITZERLAND and [2]Karlsruhe Institute of Technology (KIT), GERMANY

11:30 - 11:50

T2B1-4 **MULTIPLEXED ANALYSIS OF SIGNALING PROTEINS AT THE SINGLE IMMUNE CELL LEVEL**
Claudius L. Dietsche, Elisabeth Hirth, and Petra S. Dittrich
ETH Zürich, SWITZERLAND

Session T2C1 - Biomolecular Assays II
Virtual
Session Chair: Govind Kaigala, IBM Research - Zurich, SWITZERLAND

10:20 - 10:50

Keynote Presentation

T2C1-1 **CONTROLLING THE BULK BY THE SURFACE: TAILORING SURFACE GEOMETRY AND CHEMISTRY FOR MICROFLUIDIC APPLICATIONS IN VARIOUS FIELDS**
Jan C.T. Eijkel
University of Twente, NETHERLANDS

10:50 - 11:10

T2C1-2 **ON-DEMAND PERM-SELECTIVE MEDIUM USING MICROVALVES FOR IONIC CONCENTRATION-POLARIZATION-BASED PRECONCENRATION**
Barak Sabbagh, Sinwook Park, and Gilad Yossifon
Technion–Israel Institute of Technology, ISRAEL

11:10 - 11:30

T2C1-3 **SELECTIVE EXTRACTION OF BIOMOLECULES USING A BIDIRECTIONAL FLOW FILTER**
Vesna Bacheva[1,2], Federico Paratore[2,3], Maya B. Dolev[1], Baruch Rofman[1],
Govind V. Kaigala[2], and Moran Bercovici[1]
[1]Technion - Israel Institute of Technology, ISRAEL, [2]IBM Research Europe, SWITZERLAND, and [3]ETH Zurich, SWITZERLAND

11:30 - 11:50

T2C1-4 **DROPLET DIGITAL QUANTIFICATION OF NUCLEIC ACIDS WITH CAS13A**
Frank X. Liu, Johnson Q. Cui, and Shuhuai Yao
Hong Kong University of Science and Technology, HONG KONG

Speaker Corner

11:50 - 12:20 Jens Ducrée - Virtual
Jan C.T. Eijkel - Virtual
James Friend – Lobby of Palm Springs Convention Center

11:50 - 13:10 Lunch and Guided Mixer

T2A - Industrial Stage 2
Virtual
Session Chair: Josh Molho, Bio-Techne, USA

12:00 - 12:20 2a - RAN Biotechnologies
ON DEMAND MATERIALS FOR NEXT GENERATION SCIENCE

12:20 - 12:40 2b - Sensific Gmbh
HIGH-SPEED ANALYSIS AND CONTROL OF MICROFLUIDICS BY COMBINED BRIGHTFIELD AND FLUORESCENT IMAGING

12:40 - 13:00 2c - Bartels Mikrotechnik GmbH
HOW TO CREATE A FLUIDIC SOLUTION WITH MICROPUMP

T2A - Plenary Presentation III
Primrose Ballroom B - In-Person/Virtual
Session Chair: Joel Voldman, Massachusetts Institute of Technology, USA

13:10 - 13:55

T2APL-3 **ENGINEERING CELLS AND MICROSYSTEMS TO STUDY MECHANOBIOLOGY**
Beth L. Pruitt
University of California, Santa Barbara, USA

Speaker Corner

13:55 - 14:25 Beth Pruitt - Lobby of Palm Springs Convention Center

13:55 - 14:10 Transition

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Poster Sessions T3A, T3B, and T3C
Gather.Town

14:10 - 15:10 Presentations are listed by topic category with their assigned number starting on page 58.

14:40 - 15:10 Break and Exhibit Inspection

Session T2A2 - Clinical Applications
Primrose Ballroom B - In-Person/Virtual
Session Chair: Darwin Reyes, National Institute of Standards and Technology (NIST), USA

15:10 - 15:40

Keynote Presentation

T2A2-1 **LEVERAGING MICROFLUIDICS FOR HIGH-THROUGHPUT BIOPHYSICS, BIOCHEMISTRY, AND SINGLE-CELL BIOLOGY**
Polly Fordyce
Stanford University, USA

15:40 - 16:00

T2A2-2 **INTEGRATION OF SAMPLE PREPARATION WITH RNA AMPLIFICATION DEVICE FOR INFLUENZA VIRUS DETECTION**
Morteza Alipana, Xiao Jiang, Carlos Manzanas, Julia C. Loeb, Maohua Pan, Trevor B. Tilly, John A. Lednicky, Chang-Yu Wu, and Z. Hugh Fan
University of Florida, USA

16:00 - 16:20

T2A2-3 **ELECTROCHEMICAL CAPILLARY-FLOW DRIVEN IMMUNOASSAY FOR DETECTION OF SARS-COV-2 NUCLEOCAPSID PROTEIN**
Kaylee M. Clark, Isabelle C. Samper, Catherine McMahon, Melissa Schenkel, Loran Anderson, Brian J. Geiss, David S. Dandy, Charles S. Henry
Colorado State University, USA

16:20 - 16:40

T2A2-4 **SELF-CONTAINED PAPER MICROFLUIDIC FOR TRIPLE ANTIBIOTIC SUSCEPTIBILITY OF HOSPITAL ACQUIRED INFECTIONS**
Taylor M. Oeschger and David C. Erickson
Cornell University, USA

Session T2B2 - Novel Geometries
Virtual
Session Chair: Jacqueline Linnes, Purdue Univeristy, USA

15:10 - 15:40

Keynote Presentation

T2B2-1 **OPEN MICROFLUIDIC ORGAN MODELS AND METHODS FOR AT-HOME BLOOD TRANSCRIPTOMICS**
Ashleigh B. Theberge
University of Washington, USA

15:40 - 16:00

T2B2-2 **FLUIDIC BRUSH: IN-SITU DELIVERY OF TISSUE PRECURSORS ONTO PHYSIOLOGICALLY RELEVANT, CURVILINEAR TOPOLOGIES**

Ehsan Samiei[1], Sushant Singh[1], Lihua Wei[1], Teodor Veres[1,2], and Axel Günther[1]
[1]University of Toronto, CANADA and [2]National Research Council of Canada, CANADA

16:00 - 16:20

T2B2-3 **DIELECTROPHORESIS-ASSISTED TRANSFECTION OF CELLS RAILING ALONG 3D MICROELECTRODE TRACKS**

Yang Bu, Zili Tang, Sheng Ni, and Levent Yobas
Hong Kong University of Science and Technology, CHINA

16:20 - 16:40

T2B2-4 **METABOLIC CO-CULTURE OF ADIPOSE TISSUE, SKELETAL MUSCLE, & LIVER ON A RECIRCULATORY MICROFLUIDIC PLATFORM**

Chak Ming Leung[1], Hsih Yin Tan[1], Sangho Kim[1], and Yi-Chin Toh[2]
[1]National University of Singapore, SINGAPORE and [2]Queensland University of Technology, AUSTRALIA

Session T2C2 - Immiscible Phases I
Virtual

Session Chair: Hang Lu, Georgia Institute of Technology, USA

15:40 - 16:00

T2C2-2 **HIGH-SPEED DROPLET SQUEEZING FOR T-CELL ENGINEERING**

You-Jeong Kim[1,2], Ha-Sung Lee[2], and Aram Chung[2]
[1]Sookmyung Women's University, KOREA and [2]Korea University, KOREA

16:00 - 16:20

T2C2-3 **THE O-FILTER: A SURFACE INVISIBILITY CLOAK FOR SELECTIVE SURFACE CHEMISTRY**

Etienne Boulais, Oscar Boyadjian, and Thomas Gervais
Polytechnique Montréal, CANADA

16:20 - 16:40

T2C2-4 **FINGER-ACTUATED MONODISPERSE DROPLET GENERATOR AS A SAMPLE PREPARATION TOOL FOR DROPLET DIGITAL PCR**

Juhwan Park[1,2], Kyoung G. Lee[3], Dong Hyun Han[1], Ji-Soo Lee[4], Seok Jae Lee[3], and Je-Kyun Park[1]
[1]Korea Advanced Institute of Science and Technology (KAIST), KOREA, [2]Korea Institute of Science and Technology (KIST), KOREA, [3]National Nanofab Center (NNFC), KOREA, and [4]TNS Co., Ltd., KOREA

16:40 - 16:55 Transition

Session T2A3 - Droplets, Vesicles, and Cells
Primrose Ballroom B - In-Person/Virtual

Session Chair: Sindy Tang, Stanford University, USA

16:55 - 17:15

T2A3-1 **SORTING SINGLE-CELLS BASED ON EXTRACELLULAR VESICLE SECRETION USING 3D STRUCTURED MICROPARTICLES**

Doyeon Felis Koo, Shreya Udani, Robert Dimatteo, Sohyung Lee, and Dino Di Carlo
University of California, Los Angeles, USA

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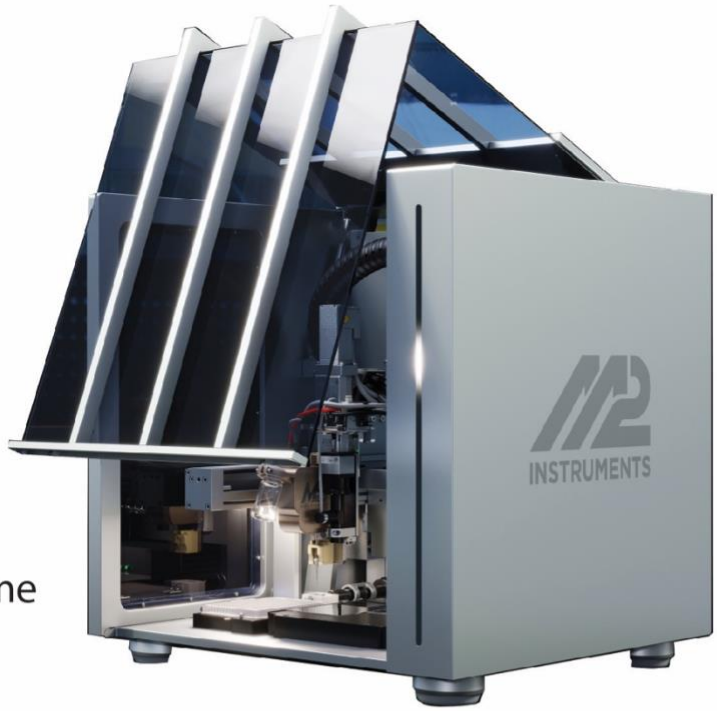

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17:15 - 17:35

T2A3-2 **RATIONAL CONSTRUCTION OF MULTI-DOMAIN PROTEIN LIBRARIES WITH HYBRID DROPLET-VALVE MICROFLUIDICS**

Iain C. Clark[1], Bruk Mensa[2], Christopher J. Ochs[2], Nathan W. Schmidt[2], Marco Mravic[2], Francisco J. Quintana[3], William F. DeGrado[2], and Adam R. Abate[2,4]
[1]University of California, Berkeley, USA, [2]University of California, San Francisco, USA, [3]Harvard Medical School, USA, and [4]Chan Zuckerberg Biohub, San Francisco

17:35 - 17:55

T2A3-3 **HIGH THROUGHPUT LIPOSOME SYNTHESIS WITH EXTREME SIZE CONTROL BY FOCUSED VORTEX MIXING**

Jung Y. Han, Joseph La Fiandra, and Don L. DeVoe
University of Maryland, USA

17:55 - 18:15

T2A3-4 **HYDRODYNAMICALLY-INDUCED DROPLET MICROVORTICES FOR CELL PAIRING APPLICATIONS**

Xuhao Luo, Braulio Cardenas-Benitez, Francesco Palomba, Michelle A. Digman, and Abraham P. Lee
University of California, Irvine, USA

Session T2B3 - Polymer Constructs
Virtual

Session Chair: Kazuma Mawatari, University of Tokyo, JAPAN

16:55 - 17:15

T2B3-1 **FLOW-SYNTHESIS OF COLLAGEN MICROGELS FOR VERSATILE TISSUE ENGINEERING APPLICATIONS**

Ehsan Samiei[1], Teodor Veres[1,2], and Axel Günther[1]
[1]University of Toronto, CANADA and [2]National Research Council of Canada, CANADA

17:15 - 17:35

T2B3-2 **INTERNAL SKELETON MANIPULATION OF ENDOSKELETAL DROPLETS USING ACOUSTIC WAVES**

Gazendra Shakya, Tao Yang, Yu Gao, Apresio K. Fajrial, Mark A. Borden, and Xiaoyun Ding
University of Colorado, Boulder, USA

17:35 - 17:55

T2B3-3 **CATHETER DELIVERY OF RADIOPAQUE CELL-ENCAPSULATED HYDROGEL MICROFIBERS FOR CELL THERAPY**

Naoki Takakura[1], Hiroki Ohta[2], Teppei Komatsu[2], Yuta Kurashina[3], Hirotaka J. Okano[2], and Hiroaki Onoe[1]
[1]Keio University, JAPAN, [2]Jikei University School of Medicine, JAPAN, and [3]Tokyo Institute of Technology, JAPAN

17:55 - 18:15

T2B3-4 **ACCELERATED FORMATION OF CAPILLARY BED STRUCTURES USING FRAGMENTED SACRIFICIAL MICROFIBERS**

Mizuki Hirata, Masumi Yamada, Rie Utoh, and Minoru Seki
Chiba University, JAPAN

Session T2C3 - Deformable Systems
Virtual
Session Chair: Ian Papautsky, University of Illinois at Chicago, USA

16:55 - 17:15

T2C3-1 **DYNAMIC DEFORMABLE METAL STRUCTURE FOR SIZE-SELECTIVE SEPARATION OF TARGET SUBSTANCES**
Seitaro Kumamoto[1,2], Souichiro Fukuyama[1], Keiichiro Yasuda[2], Yusuke Kitamura[1], Masaaki Iwatsuki[1], Hideo Baba[1], Toshihiro Ihara[1], Yoshitaka Nakanishi[1], and Yuta Nakashima[1]
[1]Kumamoto University, JAPAN and [2]Ogic Technologies Co. Ltd., JAPAN

17:15 - 17:35

T2C3-2 **STRETCHABLE INERTIAL MICROFLUIDICS FOR ISOLATION OF CANCER CELLS WITH LARGE SIZE DISTRIBUTIONS**
Hedieh Fallahi, Sharda Yadav, Hoang-Phuong Phan, Hang Ta, Jun Zhang, and Nam-Trung Nguyen
Griffith University, AUSTRALIA

17:35 - 17:55

T2C3-3 **INTEGRATED STRETCH CIRCUITS FOR HIGH RESOLUTION MONITORING**
Yonhxiao Zhou[1], Erik M. Werner[1], Eugene Lee[2], Michael Chu[1], Thao Nguyen[1], Kevin D. Costa[2,3], Elliot E. Hui[1], and Michelle Khine[1,2]
[1]University of California, Irvine, USA, [2]Novoheart, Vancouver, CANADA and [3]Icahn School of Medicine at Mount Sinai, New York, USA

17:55 - 18:15

T2C3-4 **A WEARABLE MICROFLUIDIC MULTIPLEX IMMUNOSENSING TECHNOLOGY FOR IN-SITU MONITORING OF CHRONIC WOUNDS**
Yuji Gao and Chwee Teck Lim
National University of Singapore, SINGAPORE

18:15 - 18:45 Taco Tuesday Break

T2A - Plenary Presentation IV
Virtual
Session Chair: Dino Dicarlo, University of California, Los Angeles, USA

18:45 - 19:30

T2APL-4 **SELF-POWERED INTEGRATED SMART SYSTEM**
Haixia "Alice" Zhang
Peking University, CHINA

Speaker Corner

19:30 - 20:00 Haixia "Alice" Zhang - Virtual
Polly Fordyce - Lobby of Palm Springs Convention Center
Ashleigh Theberge - Virtual

20:00 Adjourn for the Day

20:00 - 21:30 Women in Microfluidics Dessert Reception

Wednesday, 13 October

All indicated times are US Pacific Daylight Times (PDT).

08:15 - 08:30 Announcements
W3A

W3A - Lab on a Chip and Dolomite - Pioneers in Miniaturization Lectureship Prize and Presentation Virtual

08:30 - 08:50 **A LOVE STORY OF IMAGING AND MICROFLUIDICS**
Keisuke Goda
University of Tokyo, JAPAN

08:50 - 09:05 Transition

Session W3A1 - Point of Care
Primrose Ballroom B - In-Person/Virtual
Session Chair: Kevin Nichols, Amazon Diagnostics, USA

09:05 - 09:25

W3A1-1 **RAPID, CAPILARY-DRIVEN IMMUNOASSAY FOR SARS-COV-2 DETECTION**
Jeremy S. Link[1], Cody S. Carrell[1], Zachary D. Call[1], Elijah J.O. Barstis[1], Ilhoon Jang[1,2], James Terry[1], Loran Anderson[1], Yosita Panraksa[3], Brian Geiss[1], David Dandy[1], and Chuck Henry[1]
[1]Colorado State University, USA, [2]Hanyang University, KOREA, and [3]Chulalongkorn Univeristy, THAILAND

09:25 - 09:45

W3A1-2 **MULTIPLEXED POINT-OF-CARE ELECTRICAL DETECTION OF COVID-19 BIOMARKERS USING ENZYMATICALLY AMPLIFIED METALLIZATION ON NANOSTRUCTURED SURFACES**
Neda Rafat, Hanhao Zhang, Josiah Rudge, Yuna Kim, and Aniruddh Sarkar
Georgia Institute of Technology, USA

09:45 - 10:05

W3A1-3 **MICROFLUIDIC DIAGNOSTIC AND POINT OF CARE DETECTION SYSTEM FOR SARS-COV-2 FROM SALIVA**
Robert A. Stavins, Jongwon Lim, Enrique Valera, Rashid Bashir, and William P. King
University of Illinois, Urbana-Champaign, USA

Session W3B1 - Novel Measurement Systems
Virtual
Session Chair: Lourdes Basabe, University of the Basque Country, SPAIN

09:05 - 09:25

W3B1-1 **FLUIDTIP FOR ADVANCED ATOMIC FORCE MICROSCOPY**
Ayoub Glia[1,2], Muhammedin Deliorman[1], Pavithra Sukumar[1], and Mohammad A. Qasaimeh[1,2]
[1]New York University Abu Dhabi, Abu Dhabi, UAE and [2]New York University, USA

09:25 - 09:45

W3B1-2 **GENETIC IDENTIFICATION OF THREATENED HAMMERHEAD SHARKS ILLEGALLY SOLD AT ARTISNAL FISH MARKETS IN ECUADOR**

Guuske Tiktak[1], Thomas Hughes[1], Margarita Brandt[2], Fernando Rey Diz[3], Karla Estefania Bravo Vasquez[4], César Peñaherrera[5], Alexandria Gabb[1], Bradley Cain[1], David Megson[1], Richard Preziosi[1], and Kirsty J. Shaw[1]
[1]Manchester Metropolitan University, UK, [2]Universidad San Francisco de Quito, ECUADOR, [3]WWF Fisheries Ecuador, ECUADOR, [4]Viceministerio de Acuacultura y Pesca del Ecuador, ECUADOR, and [5]MigraMar, ECUADOR

09:45 - 10:05

W3B1-3 **FAST AND ON-SITE ANIMAL SPECIES IDENTIFICATION IN PROCESSED MEAT**

Laura Niebling[1], Stefan Burger[1], Nils Paust[1,2], and Ana R. Homann[1]
[1]Hahn-Schickard, GERMANY and [2]University of Freiburg, GERMANY

Session W3C1 - Manipulation of Soft Matter
Virtual

Session Chair: Stephanie Descroix, Institut Curie - CNRS, FRANCE

09:05 - 09:25

W3C1-1 **RAPID VACUUM-DRIVEN ASSEMBLY OF DISPERSED MICROSPHERES ON THE SURFACE OF (NON-) PROFILED PERFORATED DEVICES**

Ignaas S.M. Jimidar[1,2], Nathaniel Berneman[1], Ward Van Geite[1], Han Gardeniers[2], and Gert Desmet[1]
[1]Vrije Universiteit Brussel, BELGIUM and [2]University of Twente, NETHERLANDS

09:25 - 09:45

W3C1-2 **PRECISION MEETS HIGH THROUGHPUT – CONTACTLESS SINGLE-CELL SORTING USING AN ELECTRICALLY PASSIVE MICROWELL ARRAY**

Samir Kadić[1], Pavel Takana[1], Michael Dreschmann[1], Thomas Buck[1], Aaron Dörr[1], Anne Serout[1], Jochen Hoffmann[1], Steffen Strehle[2], and Franz Lärmer[1]
[1]Robert Bosch GmbH, GERMANY and [2]Technische Universität Ilmenau, GERMANY

09:45 - 10:05

W3C1-3 **ACOUSTICALLY EXCITED CHANNEL WALLS FOR MICROBIOLOGICAL APPLICATIONS**

Michael Gerlt, Nino Läubli, Peter Ruppen, Moritz Leuthner, Michel Manser, Alexander Wüthrich, Bradley Nelson, Sven Panke, and Jürg Dual
ETH Zürich, SWITZERLAND

10:05 - 10:35 Break and Exhibit Inspection

Poster Spotlight Presentations
Virtual

10:05 - 10:35 Spotlight Presentations from Poster Session W4A - W4B - W4C
You may download a complete list of poster spotlight presentations from the website.

Poster Sessions W4A, W4B, and W4C
Gather.Town

10:35 - 11:35 Presentations are listed by topic category with their assigned number starting on page 58.

11:35 - 13:05 Lunch

W3A - Industrial Stage 3
Virtual
Session Chair: Carl Meinhart, University of California, Santa Barbara, USA

11:50 - 12:10 3a - Micronit BV

12:10 - 12:30 3b - STRATEC Consumables GmbH
MICROFLUIDICS - CHANGING THE GAME IN BIOMARKER DETECTION

12:30 - 12:50 3c - AcouSort AB
HOW TO AUTOMATE YOUR SAMPLE PREPARATION USING SOUND

W3A - Plenary Presentation V
Primrose Ballroom B - In-Person/Virtual
Session Chair: Don Devoe, University of Maryland, USA

13:05 - 13:50

W3APL-5 WOMEN INSPIRED STRATEGIES FOR HEALTH: TACKLING CANCER PREVENTION AND CONTROL FROM DIFFERENT ANGLES
Nimmi Ramanujam
Duke University, USA

W3A - MicroTAS 2022 Announcement
Virtual

13:50 - 14:00 Qun Fang, *Zhejiang University, CHINA*

Speaker Corner

13:50 - 14:20 Nimmi Ramanujam - Lobby of Palm Springs Convention Center

14:00 - 14:15 Transition

Session W3A2 - Sample Preparation and Assays
Primrose Ballroom B - In-Person/Virtual
Session Chair: Nathan Swami, University of Virginia, USA

14:15 - 14:35

W3A2-1 RAPID DETECTION OF NOVEL CORONAVIRUS SARS-COV-2 BY SOLID-STATE NANOPORE
Zifan Tang[1], Reza Nouri[1], Yusheng Zhu[2], Suresh Kuchipudi[1], and Weihua Guan[1]
[1]Pennsylvania State Univeristy, USA and [2]Penn State College of Medicine, USA

14:35 - 14:55

W3A2-2 **SAME-CELL, SINGLE-CELL DETECTION OF PROTEIN ISOFORMS AND NUCLEIC ACIDS**
Ana E. Gomez Martinez, Elisabet Rosas-Canyelles, Andrew J. Modzelewski, Alisha Geldert, Anjali Gopal, Lin He, and Amy E. Herr
University of California, Berkeley, USA

14:55 - 15:15

W3A2-3 **A PORTABLE OPEN MICROFLUIDIC MICRODROPLET-BASED AIR SAMPLER FOR BIOAEROSOL CAPTURE**
Ulri N. Lee[1], Tammi L. van Neel[1], Fang Yun Lim[1], Jian Wei Khor[1], Jiayang He[1], Ravi S. Vaddi[1], Angelo Q.W. Ong[1], Anthony Tang[1], Jean Berthier[1], John S. Meschke[1], Igor V. Novosselov[1], Erwin Berthier[1], and Ashleigh B. Theberge[2]
[1]University of Washington, Seattle, USA and [2]University of Washington School of Medicine, Seattle, USA

15:15 - 15:35

W3A2-4 **AN INTEGRATED RT-LAMP AND CRISPR ASSAY FOR NUCLEIC ACID DETECTION IN A SINGLE MICROFLUIDIC CHIP**
Diego A. Huyke, Jared Nesvet, Ashwin Ramachandran, and Juan G. Santiago
Stanford University, USA

Session W3B2 - Monitoring and Mimicking Physiology
Virtual

Session Chair: Jeroen Lammertyn, Katholieke Universiteit Leuven, BELGIUM

14:15 - 14:35

W3B2-1 **HANDHELD AND ULTRAFAST PHOTOTHERMAL QPCR SYSTEM FOR RAPID DETECTION OF SARS-COV-2**
Byoung-Hoon Kang[1,2], Kyung-Won Jang[1,2], Eun-Sil Yu[1,2], Hamin Na[1,2], and Ki-Hun Jeong[1,2]
[1]Korea Advanced Institute of Science and Technology (KAIST), KOREA and
[2]KAIST Institute for Health Science and Technology (KIHST), KOREA

14:35 - 14:55

W3B2-2 **PIVOTING MOTION IN BIPEDAL WALKING ROBOT POWERED BY SKELETAL MUSCLE TISSUE**
Ryuki Kinjo, Yuya Morimoto, and Shoji Takeuchi
University of Tokyo, JAPAN

14:55 - 15:15

W3B2-3 **A HIGH-THROUGHPUT MULTIPLEXED MICROFLUIDIC DEVICE FOR COVID-19 SEROLOGY ASSAYS**
Roberto Rodriguez-Moncayo[1], Diana Cedillo-Alcantar[1], Pablo Guevara-Pantoja[1], Oriana Chavez-Pineda[1], Jose Hernandez-Ortiz[1], Josue Amador-Hernandez[1], Gustavo Rojas-Velasco[2], Fausto Sanchez-Muñoz[2], Daniel Manzur-Sandoval[2], Luis Patino-Lopez[3], Daniel May-Arrioja[4], Rosalinda Posadas-Sanchez[2], Gilberto Vargas-Alarcon[2], and Jose L. Garcia-Cordero[1]
[1]Cinvestav, Monterrey, MEXICO, [2]Instituto Nacional de Cardiología "Ignacio Chávez", MEXICO,
[3]Centro de Investigación Científica de Yucatán (CICY), MEXICO, and
[4]Centro de Investigaciones en Óptica (CIO), MEXICO

15:15 - 15:35

W3B2-4 **FULLY AUTONOMOUS DOMINO CAPILLARIC CIRCUIT FOR INSTRUMENT-FREE, QUANTITATIVE DETECTION OF SARS-COV-2 IN SALIVA**
Azim Parandakh, Johan Renault, Will Jogia, Zijie Jin, Andy Ng, and David Juncker
McGill University, CANADA

Session W3C2 - Perturbation of Droplets and Vesicles
Virtual
Session Chair: Thomas Gervais, Polytechnique Montréal, CANADA

14:15 - 14:35

W3C2-1 **FLUORINATED PLASMONIC NANOPARTICLES: A NOVEL PHOTO-RESPONSIVE FLUOROSURFACTANT FOR DROPLET MICROFLUIDICS**
Guangyao Cheng, Kuan-Ting Lin, To Ngai, and Yi-Ping Ho
Chinese University of Hong Kong (HKSAR), CHINA

14:35 - 14:55

W3C2-2 **CONTROLLED DIVISION OF DNA-DROPLET-BASED ARTIFICIAL CELLS COUPLED WITH ENZYMATIC REACTION CASCADE**
Tomoya Maruyama, Akihiro Yamamoto, and Masahiro Takinoue
Tokyo Institute of Technology, JAPAN

14:55 - 15:15

W3C2-3 **DROPLET SQUEEZING FOR HUMAN PRIMARY T CELL TRANSFECTION**
Byeongju Joo, Jeongsoo Hur, Gi-Beom Kim, Seung-Gyu Yun, and Aram Chung
Korea University, KOREA

15:15 - 15:35

W3C2-4 **ULTRA-HIGH THROUGHPUT LABEL-FREE ISOLATION OF EXTRACELLULAR VESICLES IN SHORT ARCUATED MICROCHANNELS**
Hui Min Tay[1], Hong Boon Ong[1], Sheng Yuan Leong[1], Chengxun Su[1], Rinkoo Dalan[1,2], and Han Wei Hou[1]
[1]Nanyang Technological University, SINGAPORE and [2]Tan Tock Seng Hospital, SINGAPORE

15:35 - 16:05 Break and Exhibit Inspection

Session W3A3 - External-Force Microfluidics
Primrose Ballroom B - In-Person/Virtual
Session Chair: Kiana Aran, Keck Graduate Institute (KGI), USA

16:05 - 16:35

Keynote Presentation

W3A3-1 **FLUIDUM IN MACHINA: 3D-PRINTED MICROFLUIDIC CIRCUITRY FOR SOFT ROBOTICS**
Ryan D. Sochol
University of Maryland, College Park, USA

16:35 - 16:55

W3A3-2 **ROSETTE-INDUCED ENRICHMENT OF T CELLS FROM BLOOD USING ACOUSTOPHORETIC SEPARATION**
Vidhya Vijayakumar, Jennifer L. Walker, Jayanth Dabbi, Alket Mertiri, Rebecca J. Christianson, and Jason Fiering
Draper, USA

16:55 - 17:15

W3A3-3 **MAGNETOFLUIDICS FOR AUTOMATING SAMPLE-TO-ANSWER CANCER METHYLATION BIOMARKER DETECTION**
Alexander C. Hasnain, Alejandro Stark, Alexander Y. Trick, Ke Ma, Yulan Cheng, Stephen J. Meltzer, and Tza-Huei Wang
Johns Hopkins University, USA

17:15 - 17:35

W3A3-4 **MICROFLUIDIC VISCOMETER BY ACOUSTIC STREAMING TRANSDUCERS**
Ruoyu Jiang, Abhinand M. Sudarshana, Paul Yoo, Francesco Palomba, Michelle Digman, and Abraham P. Lee
University of California, Irvine, USA

17:35 - 18:05

Keynote Presentation

W3A3-5 **NANOPARTICLE-BASED POINT-OF-CARE MOLECULAR DIAGNOSTICS**
Jacqueline C. Linnes
Purdue University, USA

Session W3B3 - Electrical and Thermal Measurement Systems
Virtual
Session Chair: Carolyn Ren, University of Waterloo, CANADA

16:05 - 16:35

Keynote Presentation

W3B3-1 **MICROFLUIDIC SYSTEMS AND AI TO STUDY IMMUNE CELLS**
José L. García-Cordero
Gobierno de México, MEXICO

16:35 - 16:55

W3B3-2 **A SUB-nL CHIP CALORIMETER FOR THERMAL CHARACTERIZATION OF A NANOFLUID OF GOLD NANORODS**
Sheng Ni[1], Yang Bu[1], Hanliang Zhu[2], Pavel Neuzil[2,3], and Levent Yobas[1]
[1]Hong Kong University of Science and Technology, HONG KONG, [2]Northwestern Polytechnical University, CHINA, and [3]Brno University of Technology, CZECH REPUBLIC

16:55 - 17:15

W3B3-3 **NEURAL NETWORK ENHANCED REAL-TIME IMPEDANCE FLOW CYTOMETRY FOR SINGLE-CELL INTRINSIC PROPERTY CHARACTERIZATION**
Yongxiang Feng, Zhen Cheng, Huichao Chai, Weihua He, and Wenhui Wang
Tsinghua University, CHINA

17:15 - 17:35

W3B3-4 **A NOVEL MICROFLUIDIC IMPEDANCE-DEFORMABILITY CYTOMETRY FOR MULTI-PARAMETRIC SINGLE CELL BIOPHYSICAL PHENOTYPING**
Chayakorn Petchakup, Linwei He, Haoning Yang, Lingyan Gong, King Ho Holden Li, and Han Wei Hou
Nanyang Technological University, SINGAPORE

Session W3C3 - Generation and Selection of Library Panels
Virtual
Session Chair: Aaron Wheeler, University of Toronto, CANADA

16:05 - 16:35

Keynote Presentation

W3C3-1 **HIGHLY ACCURATE NUCLEIC ACID SEQUENCING THROUGH MICROFLUIDICS**
Yanyi Huang
Peking University, USA


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16:35 - 16:55

W3C3-2 **A MICROFLUIDIC GENERATOR OF RANDOM DISTRIBUTIONS OF DNA**
Shu Okumura, Benediktus N. Hapsianto, Nicolas Lobato-Dauzier, Soo Hyeon Kim, Anthony Genot, and Teruo Fujii
University of Tokyo, JAPAN

16:55 - 17:15

W3C3-3 **SELECTION OF APTAMERS AGAINST HNP-1 ON AN INTEGRATED MICROFLUIDIC CHIP FOR DETECTION OF PERIPROSTHETIC JOINT INFECTIONS**
Rishabh Gandotra[1], Hung-Bin Wu[1], Priya Gopinathan[1], Huey-Ling You[2], Feng-Chih Kuo[2], Mel S. Lee[2], and Gwo-Bin Lee[1]
[1]National Tsing Hua University, TAIWAN and [2]Chang Gung University, TAIWAN

17:15 - 17:35

W3C3-4 **VIRAL PRODUCTION AND TRANSDUCTION FOR GENE-EDITING USING MICROFLUIDICS**
Angela B.V. Quach, Samuel Little, and Steve C.C. Shih
Concordia University, CANADA

Speaker Corner

17:35 - 18:05 José García-Cordero - Virtual
Yanyi Huang - Virtual
Ryan Sochol - Lobby of Palm Springs Convention Center

18:05 - 18:35 Jaqueline Linnes - Lobby of Palm Springs Convention Center

18:35 Adjourn for the Day

19:30 - 22:00 If you are able to attend the conference in-person, join us for a Karaoke Party outside on the Plaza at the Palm Springs Convention Center. There will be an award for best costume, best singer and most entertaining singer.

Thursday, 14 October

All indicated times are US Pacific Daylight Times (PDT).

Th4A - Microsystems & Nanoengineering/Springer Nature Test of Time Award Presentation Virtual

08:30 - 08:50 **A TWO-DIMENSIONAL PAPER NETWORK FOR COMPREHESIVE DENGUE DETECTION AT THE POINT OF CARE**
Paul Yager
University of Washington, USA

Th4A - Plenary Presentation VI Virtual

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

08:50 - 09:35

Th4APL-6 **INTEGRATING ACOUSTOPHORESIS TO DROPLET MICROFLUIDICS**
Maria Tenje
Uppsala University, SWEDEN

09:35 - 09:50 Transition

Session Th4A1 - Immiscible Phases II Primrose Ballroom B - In-Person/Virtual

Session Chair: Rafael Davalos, Virginia Polytechnic Institute, USA

09:50 - 10:20

Keynote Presentation

Th4A1-1 **LAB ON A PARTICLE TECHNOLOGIES FOR DEMOCRATIZED SINGLE-CELL ASSAYS**
Dino Di Carlo
University of California, Los Angeles, USA

10:20 - 10:40

Th4A1-2 **CHIRAL LIPID BILAYERS ARE ENANTIOSELECTIVELY PERMEABLE**
Juan Hu[1], Wesley G. Cochrane[1], Alexander X. Jones[2], Donna G. Blackmond[2], and Brian M. Paegel[1]
[1]University of California, Irvine, USA and [2]Scripps Research, USA

10:40 - 11:00

Th4A1-3 **SELF-COALESCENCE MODULE ARRAYS FOR LARGE-SCALE REAGENT RECONSTITUTION AND DIFFUSION-CONTROLLED EXPERIMENT**
Thomas Gervais[1,2,3], Yuksel Temiz[1], Lucas Aubé[2], and Emmanuel Delamarche[1]
[1]IBM Research Europe - Zurich, SWITZERLAND, [2]Polytechnique Montreal, CANADA, and [3]Centre de recherche du Centre hospitalier de l'Université de Montréal, CANADA

11:00 - 11:20

Th4A1-4 **HIGH-THROUGHPUT FLOW SORTING OF MICROALGAE BASED ON BIOMASS ACCUMULATION RATES IN PRODUCTION ENVIRONMENTS USING PICOSHELLS**
Mark van Zee, Joseph de Rutte, Rose Rumyan, Cayden Williamson, and Dino Di Carlo
University of California, Los Angeles, USA

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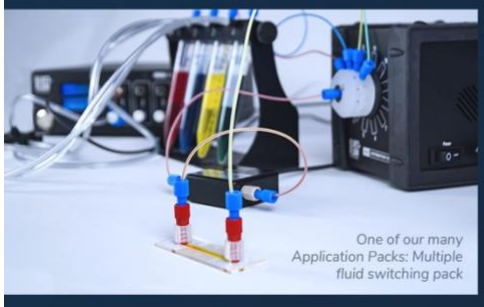

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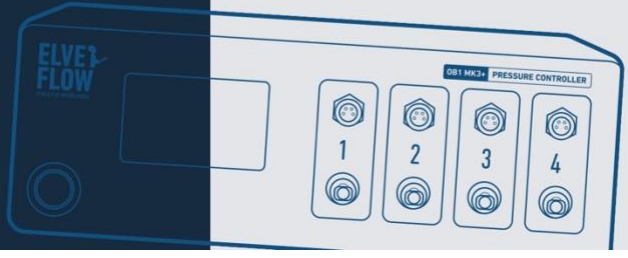

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Session Th4B1 - Organ-on-a-Chip IV
Virtual
Session Chair: Nicole Pamme, University of Stockholm, SWEDEN

09:50 - 10:20

Keynote Presentation

Th4B1-1 **COMBINING MICROFLUIDICS WITH LIVE TISSUE EXPLANTS TO MODEL LOCAL AND MULTI-ORGAN IMMUNITY**
Rebecca R. Pompano
University of Virginia, USA

10:20 - 10:40

Th4B1-2 **EVALUATION OF THERAPEUTIC POTENTIAL OF PTF1A ACTIVATION TO TREAT PANCREATIC CANCER USING A MICROFLUIDIC PANCREATIC ACINAR MODEL**
Hye-ran Moon, Stephanie M. Venis, Yi Yang, Sagar M. Utturkar, Stephen F. Konieczny, and Bumsoo Han
Purdue University, USA

10:40 - 11:00

Th4B1-3 **MULTISCALE IMMUNO-ONCOLOGY ON-CHIP SYSTEM (MIOCS) ESTABLISHES THAT COLLECTIVE T CELL BEHAVIORS GOVERN TUMOR REGRESSION**
Gustave Ronteix[1,2], Shreyansh Jain[1,2], Christelle Angely[1,2], Marine Cazaux[1], Roxana Khazen[1], Philippe Bousso[1], and Charles N. Baroud[1,2]
[1]Institut Pasteur, FRANCE and [2]Institut Polytechnique de Paris, FRANCE

11:00 - 11:20

Th4B1-4 **RAPID SPHEROIDS FORMATION IN BOUNDARY-DRIVEN ACOUSTIC MICROSTREAMS**
Reza Rasouli and Maryam Tabrizian
McGill University, CANADA

Session Th4C1 - Novel Compartmentalization
Virtual
Session Chair: Marcel Utz, University of Southampton, UK

09:50 - 10:20

Keynote Presentation

Th4C1-1 **DROPLET MICROFLUIDICS IN PERSONALIZED MEDICINE, ANTIBODY DISCOVERY AND IMMUNE REPERTOIRE SEQUENCING**
Christoph Merten
Swiss Federal Institute of Technology Lausanne (EPFL), SWITZERLAND

10:20 - 10:40

Th4C1-2 **TUNABLE SUPERPARAMAGNETIC RING (TSPRING) FOR DROPLET MANIPULATION**
Vahid Nasirimarekani[1], Fernando Benito-Lopez[1], and Lourdes Basabe-Desmonts[1,2]
[1]University of the Basque Country, SPAIN and [2]Basque Foundation of Science, IKERBASQUE, SPAIN

10:40 - 11:00

Th4C1-3 **IN-DROPLET ELECTROKINETIC SEPARATION OF PROTEINS WITH PH GRADIENTS**
Mario A. Saucedo-Espinosa and Petra S. Dittrich
ETH Zürich, SWITZERLAND

11:00 - 11:20

Th4C1-4 **STORING LIQUID CHROMATOGRAPHIC SEPARATIONS ON SURFACE ENERGY TRAPS: DECOUPLING THE LC AND THE MASS SPECTROMETER**
Timothy T. Salomons and Richard D. Oleschuk
Queen's University, CANADA

Speaker Corner

11:20 - 11:50 Maria Tenje - Virtual
Dino DiCarlo - Lobby of Palm Springs Convention Center
Christoph Merten - Virtual
Rebecca R. Pompano - Virtual

11:20 - 11:50 Break and Exhibit Inspection

Th4A - Awards Ceremony and Closing Remarks
Primrose Ballroom B - In-Person/Virtual

Session Chairs: Petra Dittrich, ETH Zürich, SWITZERLAND
Thomas Gervais, École Polytechnique de Montréal, CANADA
Tae-Eun Park, Ulsan National Institute of Science and Technology (UNIST), KOREA

11:50 - 12:35 Award Ceremony
CHEMINAS - Young Researcher Poster Awards
Lab on a Chip - Widmer Poster Award
Sensors (MDPI) - Outstanding Sensors and Actuators, Detection Technologies Poster Award
IMT Masken und Teilungen AG - Microfluidics on Glass Poster Award
Micromachines (MDPI) - Outstanding Tissue or Organ on Chip Microsystems Poster Award
Biomicrofluidics (AIP) - Best Paper Awards
NIST and Lab on a Chip - Art in Science Award
Elsevier B.V. - Sensors and Actuators B. Chemical Best Paper Award
Microsystems & Nanoengineering/Springer Nature – Best Talk Award

12:35 - 12:45 Closing Remarks
Amy E. Herr, *University of California, Berkeley, USA*
Joel Voldman, *Massachusetts Institute of Technology, USA*

12:45 Conference Adjourns

Poster Presentations

All indicated times are US Pacific Daylight Times (PDT).

M1A, M1B, M1C	Monday, 11 October	16:15 - 17:15
T2A, T2B, T2C	Tuesday, 12 October	09:05 - 10:05
T3A, T3B, T3C	Tuesday, 12 October	14:10 - 15:10
W4A, W4B, W4C	Wednesday, 13 October	10:35 - 11:35

Poster numbers with an astrick * indicate they are an award nominee.

Classification Chart

(last character of poster number)

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

a - Cells, Organisms and Organs on a Chip

Bioinspired, Biomimetic and Biohybrid Devices

T2A-201.a **COMPARATIVE ASSESSMENT OF ePTFE VASCULAR GRAFT THROMBOGENICITY ON-A-CHIP**
Veronica Bot, Amid Shakeri, Jeffrey Weitz, and Tohid Didar
McMaster University, CANADA

T2B-202.a **AN ENDOTHELIALIZED, OXYGEN-TUNABLE MICROFLUIDIC PLATFORM FOR THE STUDY OF SICKLE CELL DISEASE**
Samantha R. Schad[1], Wilbur A. Lam[2,3,4], and David K. Wood[1]
[1]University of Minnesota, USA, [2]Georgia Institute of Technology, USA, [3]Emory University, USA, and [4]Emory University School of Medicine, USA

T3A-301.a **MESOTHELIAL CELL FUNCTIONALIZED BIOMIMETIC BIOSENSORS**
Insu Kim[1] and Yoon-Kyoung Cho[1,2]
[1]Institute for Basic Science, KOREA and
[2]Ulsan National Institute of Science and Technology (UNIST), KOREA

T3B-302.a **DECOUPLING CELL AND MATRIX INTERACTIONS TO SIMULATE THERAPEUTIC BIOMATERIAL DELIVERY**
Benjamin Noren, Alan Stenquist, and John Oakey
University of Wyoming, USA

T3C-303.a CONSTRUCTION OF THREE-DIMENSIONAL SKELETAL MUSCLE TISSUE WITH IMPROVED CONTRACTILE FORCE BASED ON ANCHOR SHAPE
Takumi Hishinuma, Yuya Morimoto, and Shoji Takeuchi
University of Tokyo, JAPAN

W4A-401.a EARLY DIAGNOSIS OF INFECTION AND CANCER USING LEUKOCYTE ADHESION IN AN INFLAMMATORY VASCULAR ENDOTHELIUM-MIMICKING MICROFLUIDIC DEVICE
Min Seok Lee, Seyong Kwon, Amanzhol Kurmashev, Brian Choi, and Joo H. Kang
Ulsan National Institute of Science and Technology (UNIST), KOREA

W4B-402.a PATTERNS OF INSULIN SECRETION WITH NEGATIVE FEEDBACK AND VARIABLE TIME DELAYS
I-An Wei, Weijia Leng, Richard Bertram, and Michael Roper
Florida State University, USA

a - Cells, Organisms and Organs on a Chip
Cell Capture, Counting, and Sorting

M1A-101.a FLOW THROUGH TARGET BACTERIA CAPTURE, LYSIS AND DNA EXTRACTION USING MAGNETIC CLOUDS
Lidija Malic, Lucas Poncelet, Liviu Clime, Matthias Geissler, Keith Morton, Christina Nassif, Dillon Da Fonte, Gaétan Veilleux, and Teodor Veres
National Research Council of Canada, CANADA

M1B-102.a IMAGE-ACTIVATED SORTING OF GENETICALLY PERTURBED YEAST TOWARDS IMAGE-BASED POOLED SCREENS
Mika Hayashi[1], Natsumi Tiffany Ishii[1], Jeffrey Harmon[1], Taketo Araki[1], Shinsuke Ohnuki[1], Naoko Kondo[1], Akihiro Isozaki[1], Yoshikazu Ohya[1], and Keisuke Goda[1,2,3]
[1]University of Tokyo, JAPAN, [2]University of California, Los Angeles, USA, and [3]Wuhan University, CHINA

M1C-103.a BIOELECTRONIC CAPTURE AND RELEASE OF CANCER CELLS
Janire Saez[1], Maite Garcia-Hernando[2], Achilleas Savva[1], Lourdes Basabe-Desmonts[2,3], Fernando Benito-Lopez[2], and Róisín M. Owens[1]
[1]University of Cambridge, UK, [2]University of the Basque Country, SPAIN, and [3]Basque Foundation of Science, IKERBASQUE, SPAIN

M1A-104.a HIGH-THROUGHPUT INTELLIGENT IMAGE-ACTIVATED SORTING OF RECEPTOR-LOCALIZING T CELLS
Natsumi Tiffany Ishii[1], Tsubasa Wakamiya[1], Taketo Araki[1], Mika Hayashi[1], Hiroki Matsumura[1], Kazuma Kita[2], Yuma Oka[2], Masatoshi Yanagida[2], Akihiro Isozaki[1], and Keisuke Goda[1,3,4]
[1]University of Tokyo, JAPAN, [2]Sysmex Corporation, JAPAN, [3]University of California, Los Angeles, USA, and [4]Wuhan University, CHINA

M1B-105.a MANIPULATION OF MULTIPLE CELLS BASED ON A FLUID RESISTANCE CONTROL BY USING INTEGRATED GEL ACTUATORS
Yuha Koike[1], Hiroki Wada[1], Shunnosuke Kodera[1], Yoshiyuki Yokoyama[2], and Takeshi Hayakawa[1]
[1]Chuo University, JAPAN and [2]Toyama Industrial Technology Research and Development Center, JAPAN

M1C-106.a CELL SORTING SYSTEM USING LIGHT-ACTUATED SHAPE MEMORY POLYMER
Aisuke Mifune, Daisuke Saito, and Masashi Ikeuchi
University of Tokyo, JAPAN

T2C-203.a A MICROFLUIDIC DEVICE BASED ON CAPILLARY VALVES FOR DETERMINISTIC SINGLE CELL TRAPPING AND RELEASE
Huichao Chai, Yongxiang Feng, Fei Liang, and Wenhui Wang
Tsinghua University, CHINA

T2A-204.a ACTUATING THERMAL GEL BARRIERS WITH TARGETED JOULE HEATING FOR CELL ENRICHMENT
Mario A. Cornejo and Thomas H. Linz
Wayne State University, USA

T2B-205.a DROPLET MICROFLUIDIC PLATFORM FOR THE EARLY AND LABEL-FREE ISOLATION OF ACTIVATED T-CELLS
Claudia Zielke, Adriana J. Gutierrez Ramirez, and Paul Abbyad
Santa Clara University, USA

T2C-206.a DOUBLE PULSES EFFECT TO REALIZING HIGH THROUGHPUT MULTIPLE CELL SORTING SYSTEM BY USING IMPACT FORCE OF FEMTOSECOND LASER
Ryota Kiya[1], Yo Tanaka[2], Yaxiaer Yalikun[1,2], and Yoichiroh Hosokawa[1]
[1]Nara Institute of Science and Technology, JAPAN and [2]RIKEN, JAPAN

T2A-207.a NEURITE GROWTH KINETICS REGULATION THROUGH HYDROSTATIC PRESSURE IN A NOVEL TRIANGLE-SHAPED NEUROFLUIDIC SYSTEM
Jessica Rontard[1], Benoit G.C. Maisonneuve[2], Aurelie Batut[1], Janaina Vieira[1], Mélanie Gleyzes[1], Florian Larramendy[1,2], and Thibault Honegger[1,2]
[1]Neuro Engineering Technologies Research Institute (NETRI), FRANCE and
[2]University of Grenoble Alpes, FRANCE

T2B-208.a EXPANDING VORTEX TRAPPING TARGET SMALL, NON-CANCEROUS CELLS
Srivathsan Kalyan and Soojung Claire Hur
Johns Hopkins University, USA

T2C-209.a MEMBRANE TRAP ARRAYS FOR CONTINUOUS MONITORING AND ENDPOINT ANALYSIS OF SELECTED CELL ENSEMBLES
Michael Yeh[1,2], Emanuel Salazar Cavazos[2], Supriya Padmanabhan[1], Grégoire Altan-Bonnet[2], and Don L. DeVoe[1]
[1]University of Maryland, USA and [2]National Cancer Institute, USA

T3A-304.a TUNABLE POROUS PIEZOELECTRIC MEMBRANE FOR THE SEPARATION OF BACTERIA FROM BLOOD
Alison Burklund[1], Andrew Closson[1], John Molinski[1], and John X.J. Zhang[1,2]
[1]Dartmouth College, USA and [2]Dartmouth Hitchcock Medical Center, USA

T3B-305.a PHOTORESPONSIVE POLYETHYLENE GLYCOL HYDROGEL MEMBRANE ENABLED HIGH-THROUGHPUT MICROWELL SCREENING OF PLANT ROOT MICROBIOMES
Niloy Barua[1], Mei He[1], and Ryan Hansen[2]
[1]University of Florida, USA and [2]Kansas State University, USA

T3C-306.a CAPSULE VENDING MACHINE-LIKE DEVICE FOR CELL RELEASE WITH EQUAL INTERVALS
Meito Fukada, Kazuma Saito, and Taiji Okano
Tokyo University of Agriculture and Technology, JAPAN

T3A-307.a BLOOD-BRAIN BARRIER SPHEROID ARRAY FOR DRUG-UPTAKE ASSAY
Ai Shima, Minghao Nie, and Shoji Takeuchi
University of Tokyo, JAPAN

T3B-308.a DEFORMABILITY BASED CELL SORTING AS A BIOMARKER FOR THE QUALITY OF STORED RED BLOOD CELLS
Emel Islamzada[1], Kerryn Matthews[1], Erik Lamoureux[1], Mark D. Scott[1,2], and Hongshen Ma[1,3]
[1]University of British Columbia, CANADA, [2]Canadian Blood Services, Ottawa, CANADA, and [3]Vancouver General Hospital, CANADA

T3C-309.a LABEL-FREE DIELECTROPHORETIC SEPARATION OF CANCER CELLS BY DRUG RESISTANCE
Kazuma Yoda[1], Yuto Sasaki[1], Ken Yamamoto[2], Yoshiyasu Ichikawa[1], and Masahiro Motosuke[1]
[1]Tokyo University of Science, JAPAN and [2]Osaka University, JAPAN

T3A-310.a LAMINATED CHIP AND PREVENTION OF CLOGGING
Madoka Ayano, Miho Nagashima, Keita Takahashi, and Tomohiro Kubo
TL Genomics Inc., JAPAN

W4C-403.a SIMULTANEOUS BIOCHEMICAL AND FUNCTIONAL PHENOTYPING OF SINGLE CIRCULATING TUMOR CELLS USING ULTRAHIGH THROUGHPUT MICROFLUIDIC DEVICES
Yang Liu and Leidong Mao
University of Georgia, USA

W4A-404.a MICROBIAL PATHOGENS REMOVAL FROM PORCINE SEMEN WITH ACOUSTOPHORESIS
Tanja Hamacher[1], Anke Urbansky[2], Marleen L.W.J. Broekhuijse[3,4], and Loes I. Segerink[1]
[1]University of Twente, NETHERLANDS, [2]AcouSort AB, SWEDEN, [3]CRV BV, NETHERLANDS, and [4]Topigs Norsvin, NETHERLANDS

W4B-405.a ELECTROFUSION OF CELLS WITH DIFFERENT SIZES BY FORMING THE ASYMMETRIC ELECTRIC FIELDS
Ikumi Onohara[1], Masato Suzuki[1], Yushi Isozaki[2], Kanta Tsumoto[2], Masahiro Tomita[2], and Tomoyuki Yasukawa[1]
[1]University of Hyogo, JAPAN and [2]Mie University, JAPAN

W4C-406.a **Poster will be presented on Monday, in Poster Room M1C**
MICROFLUIDIC DEVICE FOR THE DYNAMIC CHARACTERIZATION OF CELL ADHESION USING SINGLE CELL ADHESION DOT ARRAYS (SCADA)
Alba Calatayud-Sanchez[1], Sara Caceido de la Arada[1], Yara Alvarez-Braña[1], Fernando Benito-Lopez[1], and Lourdes Basabe-Desmonts[1,2]
[1]University of the Basque Country, SPAIN and [2]Basque Foundation of Science, IKERBASQUE, SPAIN

W4A-407.a LAB-IN-A-FIBER MICROFLUIDIC CYTOMETER FOR POINT-OF-CARE BIOMEDICAL DIAGNOSTICS
Achar Vasant Harish[1,2], Kumar Tharagan[1], Aman Russom[1], Walter Margulis[1,2], and Fredrik Laurell[1]
[1]KTH Royal Institute of Technology, SWEDEN and [2]Research Institutes of Sweden (RISE), SWEDEN

W4B-408.a CAPTURE AND RELEASE OF SINGLE CELLS USING MICROHOLES FOR HIGH THROUGHPUT ANALYSIS OF SINGLE NEURONS
Shuntaro Iwai and Takashi Yasuda
Kyushu Institute of Technology, JAPAN

W4C-409.a ACTIVE SELECTION USING GRADIENTS AND SHEATH FLOW: DEVELOPMENT OF A VERSATILE PLATFORM FOR SPERM SORTING
Audrey Nsamela[1], Benjamin Garlan[1], Julia Sepulveda[1], and Juliane Simmchen[2]
[1]Elvesys, FRANCE and [2]Technische Universität Dresden (TUD), GERMANY

W4A-410.a CONTINOUS MONITORING OF CELL TRANSFECTION EFFICIENCY ON MICROPATTERNED SUBSTRATES
Enrique Azuaje-Hualde[1], Melania Rosique[1], Alba Calatayud-Sanchez[1], Fernando Benito-Lopez[1], Marian Martinez de Pancorbo[1], and Lourdes Basabe-Desmonts[1,2]
[1]University of the Basque Country, SPAIN and [2]Basque Foundation of Science, IKERBASQUE, SPAIN

W4B-411.a A CELL'S JOURNEY FROM MICROFLUIDIC CHIP TO RECIPIENT
Karen Ven, Jolien Breukers, Iene Rutten, Caroline Struyfs, Louanne Ampofo, and Jeroen Lammertyn
Katholieke Universiteit Leuven, BELGIUM

W4C-412.a FOMATION OF BACTERIA STREAM IN LINE BY DIELECTROPHORESIS
Takatoki Yamamoto
Tokyo Institute of Technology, JAPAN

a - Cells, Organisms and Organs on a Chip
Cell-Culturing and Perfusion (2D and 3D)

M1A-107.a* MICROFLUIDIC PRODUCTION OF COLLAGEN SHEET-BASED CELL ENVELOPE FOR FLOATING SANDWICH CULTURE OF HEPATOCYTES
Mai Takagi, Kanta Momiyama, Masumi Yamada, Rie Utoh, and Minoru Seki
Chiba University, JAPAN

M1B-108.a* MASS PRODUCTION AND SELECTIVE MANIPULATION OF SPHEROIDS USING THE INTEGRATION OF HANGING DROP MICROARRAY AND DROPLET CONTACT-BASED SPHEROID TRANSFER
Hwisoo Kim, Jieun Han, and Je-Kyun Park
Korea Advanced Institute of Science and Technology (KAIST), KOREA

M1C-109.a* FORMATION OF PERFUSABLE SKELETAL MUSCLE TISSUE
Tomohito Nakayama, Byeongwook Jo, Yuya Morimoto, and Shoji Takeuchi
University of Tokyo, JAPAN

M1A-110.a 18F-FLUORODEOXYGLUCOSE IMAGING OF TUMOR-ON-A-CHIP
Syamantak Khan, Alison D. Bick, Barzin Nabet, Maximilian Diehn,
Sindy K.Y. Tang, and Guillem Pratx
Stanford University, USA

M1B-111.a A TUNABLE DECELLULARIZED LIVER-BASED HYBRID BIOINK
Vamakshi Khati[1], Harisha Ramachandraiah[2], Giulia Gaudenzi[1], Falguni Pati[3], Helene A. Svahn[1], and Aman Russom[1]
[1]KTH Royal Institute of Technology, SWEDEN, [2]Biopromic AB, SWEDEN, and [3]Indian Institute of Technology (IIT), INDIA

T2A-210.a A DYNAMIC CELL CULTURE MICRO-REACTOR USING SURFACE ACOUSTIC WAVE
Seunggyu Kim and Jessie S. Jeon
Korea Advanced Institute of Science and Technology (KAIST), KOREA

T2B-211.a A MICROFABRICATED STRETCHABLE HYDROGEL DEVICE FOR THE CULTURE OF OSTEOBLAST-BASED 3D TISSUE
Kohei Fukushima, Minghao Nie, Yuya Morimoto, and Shoji Takeuchi
University of Tokyo, JAPAN

T2C-212.a NOVEL MICROFLUIDIC APPROACH FOR LABEL-FREE CELL ANALYSIS USING ON-CHIP HOLOGRAPHIC TOMOGRAPHY
Katarzyna Tokarska, Kamil Żukowski, Wojciech Krauze, Maria Baczewska, Arkadiusz Kuś, Malgorzata Kujawińska, Elżbieta Malinowska, and Zbigniew Brzózka
Warsaw University of Technology, POLAND

T3B-311.a ON SITE CELL ASSEMBLY USING OPTICALLY-DRIVEN MICROTOOLS WITH ANTIBODY-IMMOBILIZED SURFACE
Shuntaro Mori, Hidekuni Takao, Fusao Shimokawa, and Kyohei Terao
Kagawa University, JAPAN

T3C-312.a STUDY SPROUTING OF ENDOTHELIAL CELLS INTO THREE-DIMENSIONAL (3D) MATRICES UNDER OXYGEN GRADIENTS USING MICROFLUIDIC DEVICES
Heng-Hua Hsu[1,2], Ping-Liang Ko[2,3], and Yi-Chung Tung[2]
[1]National Tsing Hua University, TAIWAN, [2]Academia Sinica, TAIWAN, and [3]National Taiwan University, TAIWAN

T3A-313.a SCALABLE STEREOLITHOGRAPHY-BASED MONOLITHIC MICROFLUIDIC DEVICE CREATION FOR RAPID BIOLOGICAL SAMPLE ANALYSES
Alex Markoski[1,2], Ian Y. Wong[2], and Jeffrey T. Borenstein[1]
[1]Draper, USA and [2]Brown University, USA

T3B-314.a MICROFLUIDIC CELL CULTURE SYSTEM ASSEMBLED WITH A CELL–HYDROGEL PATTERN ARRAY BIOPRINTED ON A MICROSTRUCTURED SUBSTRATE
Gihyun Lee, Soo Jee Kim, and Je-Kyun Park
Korea Advanced Institute of Science and Technology (KAIST), KOREA

T3C-315.a BIOPRINTING ON A MICROSTRUCTURED SUBSTRATE TO ENHANCE THE PRINTABILITY AND STABILITY OF FIBRINOGEN
Soo Jee Kim, Gihyun Lee, and Je-Kyun Park
Korea Advanced Institute of Science and Technology (KAIST), KOREA

T3A-316.a HONACHIP (HYPOXIA ON A CHIP): INSIGHTS INTO TREATMENT EFFICACY
Elena Refet-Mollof[1,2,3], Ouafa Najyb[2,3], Rodin Chermat[1,2,3], Audrey Glory[1,3], Julie Lafontaine[1,3], Philip Wong[2,3], and Thomas Gervais[1,2,3]
[1]Polytechnique Montreal, CANADA, [2]Centre hospitalier de l'Université de Montréal, CANADA, and [3]Institut du cancer de Montréal, CANADA

T3B-317.a MICROPATTERNED CO-CULTURES OF HUMAN IPSC-DERIVED ATRIAL CARDIOMYOCYTES AND CARDIAC FIBROBLASTS FOR DISEASE MODELING AND DRUG SCREENING
Yong Duk Han, Grace Brown, Olivia Ly, Dawood Darbar, and Salman R. Khetani
University of Illinois, Chicago, USA

T3C-318.a EXPLOITING FLUID WALLS TO PERFUSE CELL CULTURES PASSIVELY
Federico Nebuloni[1], Cyril Deroy[1], Nicholas Stovall-Kurtz[1], Cristian Soitu[1], Peter R. Cook[1,2], and Edmond J. Walsh[1]
[1]University of Oxford, UK and [2]iotaSciences Ltd., UK

T3A-319.a PULSATILE FLOW ANALYSIS AT BRANCHED POINT IN ECM-BASED ENDOTHELIAL VASCULAR MODEL UNDER MECHANICAL STRETCH
Jumpei Muramatsu[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

T3B-320.a PERMEABLE BIO-PRINTED VESSEL FOR CULTURED TISSUE
Jung-Chun Sun, Byeongwook Jo, Yuya Morimoto, and Shoji Takeuchi
University of Tokyo, JAPAN

T3C-321.a **A HIGH-THROUGHPUT-3D COLON CANCER TUMOR MICRO-SPHEROIDS FOR STUDYING TUMOUR MICROENVIRONMENT INDUCED STIFFNESS VARIATION AND DRUG RESISTANCE**
Venkanagouda S. Goudar[1], Long-Sheng Lu[2], Manohar Prasad Koduri[1], Ashish Kumar[1], and Fan-Gang Tseng[1,3]
[1]National Tsing Hua University, TAIWAN, [2]Taipei Medical University Hospital, TAIWAN, and [3]Academia Sinica, TAIWAN

W4A-413.a **MODELLING THE BLOOD VESSEL WALL WITH SPIDER SILK NANOMEMBRANES**
Linnea Gustafsson, Christos Panagiotis Tasiopoulos, My Hedhammar, and Wouter van der Wijngaart
KTH Royal Institute of Technology, SWEDEN

W4B-414.a **PRECISE AND FAST CONTROL OF THE DISSOLVED OXYGEN LEVEL IN A TUMOR-ON-CHIP**
Charlotte Bouquerel, Lara Barthod, Giacomo Gropplero, Maria-Carla Parrini, and Stéphanie Descroix
Institut Curie, FRANCE

W4C-415.a* **INTEGRATED LABEL-FREE MICROFLUIDIC PLATFORM FOR AUTOMATED CELLULAR MONITORING AND REAL-TIME ACTUATED SORTING OF CELL-LADEN MICROCARRIERS**
Lingyan Gong, Chayakorn Petchakup, and Han Wei Hou
Nanyang Technological University, SINGAPORE

W4A-416.a **HIGH-THROUGHPUT HYDROSTATIC PRESSURE WAVEFORM CONTROL USING A 3D-PRINTED DEVICE**
Adam Szmelter, Giulia Venturini, and David T. Eddington
University of Illinois, Chicago, USA

W4B-417.a **SPHEROID-ON-CHIP MICROFLUIDIC PLATFORM REVEALS THE IMPACT OF INTERSTITIAL FLOW ON TUMOUR BIOLOGY**
Emily Pyne, Thomas Collins, Alexander Iles, Nicole Pamme, and Isabel M. Pires
University of Hull, UK

W4C-418.a **A LAYERED *MELANOMA-ON-A-CHIP* 3D CELLULAR MODEL FOR THE ANALYSIS OF THE PORPHYRIN-BASED PHOTOSENSITIZERS TOXICITY**
Magdalena Flont, Marta Bialek, Artur Dybko, Elżbieta Jastrzębska, and Zbigniew Brzózka
Warsaw University of Technology, POLAND

W4A-419.a **A GLASS MICROFLUIDIC HANGING-DROP DEVICE FOR SENSITIVE TOXICOLOGICAL EXPERIMENTS**
Konstanze Gier[1,2], Patty P.M.F.A. Mulder[1], Jean-Paul S.H. Mulder[1], Ursula Sauer[2], and Elisabeth Verpoorte[1]
[1]University of Groningen, NETHERLANDS and [2]Austrian Institute of Technology, AUSTRIA

W4B-420.a **TARGETING TUMOUR VASCULATURE USING INTEGRIN $\alpha_v\beta_3$ - OBSERVATION OF LIPOSOME ACCUMULATION IN MICROFLUIDIC VASCULATURE NETWORKS**
Matthew D. Bourn, Safoura Mohajerani, Georgia Mavria, Nicola Ingram, P. Louise Coletta, Stephen D. Evans, and Sally A. Peyman
University of Leeds, UK

W4C-421.a **TISSUES-ON-A-STRING: ANALYZING TRANSPORT WITHIN SPHEROIDS VIA PERFUSABLE GLASS-SHEATHED HYDROGEL MICROTUBES**
Chen Li, Nikita Kalashnikov, and Christopher Moraes
McGill University, CANADA

a - Cells, Organisms and Organs on a Chip
Inter-and Intracellular Signaling, Cell Migration

M1C-112.a **A MICROFLUIDIC ASSAY FOR HIGH-PERFORMANCE CHARACTERIZATION OF MOTILE CIRCULATING TUMOR CELLS**
Yang Liu and Leidong Mao
University of Georgia, USA

M1A-113.a* **REAL-TIME GUIDED AXON OUTGROWTH OF PRIMARY MOUSE HIPPOCAMPAL NEURONS ACTIVATED BY FEMTOSECOND LASER PULSES IN MICROFLUIDIC DEVICE**
Dian Anggraini[1], Xun Liu[1], Kazunori Okano[1], Sohei Yamada[1], Yo Tanaka[2], Naoyuki Inagaki[1], Yoichiroh Hosokawa[1], and Yaxiaer Yalikun[1,2]
[1]Nara Institute of Science and Technology, JAPAN and [2]RIKEN, JAPAN

M1B-114.a **CO-CULTURE MODEL OF GLUTAMATERGIC NEURONS AND PEDIATRIC HIGH-GRADE GLIOMA CELL LINES IN MICROFLUIDIC DEVICES TO EVALUATE ELECTROPHYSIOLOGICAL IMPACT**
Margot Libralato[2], Quentin Fuchs[1], Aurelie Batut[2], Mélanie Gleyzes[2], Jessica Rontard[2], Louise Miny[2], Janaina Vieira[2], Delphine Debis[2], Florian Larramendy[2], Melissa Messe[1], Marina Pierrevelcin[1], Benoit Lhermitte[1], Monique Dontenwill[1], Thibault Honegger[2], and Nathacha Entz-Werlé[1,3]
[1]UMR CNRS, FRANCE, [2]Neuro Engineering Technologies Research Institute (NETRI), FRANCE, and [3]University Hospital of Strasbourg, FRANCE

M1C-115.a **YAP DISTRIBUTION IN RESPONSE TO NUCLEAR DEFORMATION ASSESSED USING AN OPEN CHANNEL MICRODEVICE**
Kennedy O. Okeyo, Tsuyoshi Shimodaira, and Taiji Adachi
Kyoto University, JAPAN

T2A-213.a **INTRACELLULAR OXYGEN RESPONSE MONITORING WITHIN MICROFLUIDIC DEVICES USING WIDEFIELD FREQUENCY DOMAIN FLUORESCENCE LIFETIME IMAGING MICROSCOPY (FD-FLIM)**
Hsiao-Mei Wu[1], Wei-Jen Chang[1,2], Tse-Ang Lee[1], Wei-Hao Liao[1], and Yi-Chung Tung[1]
[1]Academia Sinica, TAIWAN and [2]National Yang Ming Chiao Tung University, TAIWAN

T2B-214.a **INVESTIGATING THE ROLE OF PARACRINE SIGNALLING IN THE RELEASE OF NEUTROPHIL EXTRACELLULAR TRAPS USING HYDROGEL NANOWELL-IN-MICROWELL ARRAYS**
Pan Deng, Kerryn Matthews, Simon Duffy, and Hongshen Ma
University of British Columbia, CANADA

T2C-215.a **POLYMICROBIAL INTERACTIONS BETWEEN *CANDIDA ALBICANS* AND *PSEUDOMONAS AERUGINOSA* REVEALED IN MICROFLUIDIC PLATFORM**
Le Hoang Phu Pham, Jin Ou, Khanh Loan Ly, Piao Hu, John Choy, and Xiaolong Luo
Catholic University of America, USA

T2A-216.a **DUAL DIELECTROPHORETIC ASSEMBLY OF CO-CULTURES FOR THE STUDY OF CELL MIGRATION INDUCED BY PHYSICAL INTERACTIONS**
Brian J. Nablo and Darwin R. Reyes
National Institute of Standards and Technology (NIST), USA

T3A-322.a **IMPEDIMETRIC MEASUREMENT OF 3D ANGIOGENIC PROCESS**
Chun-hao Huang[1] and Kin Fong Lei[1,2]
[1]Chang Gung University, TAIWAN and [2]Chang Gung Memorial Hospital, TAIWAN

W4A-422.a BACTERIAL MAGNETOTACTIC MOTILITY IN VISCOELASTIC FLUIDS
Brianna Bradley and Carlos Escobedo
Queen's University, CANADA

a - Cells, Organisms and Organs on a Chip
Liposomes/Membranes

M1A-116.a MONODISPERSION OF GIANT UNILAMELLAR VESICLES USING A METAL MESH FILTER
Keisuke Shinohara[1], Tsutomu Okita[1], Mamiko Tsugane[1], Takashi Kondo[2], and Hiroaki Suzuki[1]
[1]Chuo University, JAPAN and [2]Murata Manufacturing Co., Ltd., JAPAN

M1B-117.a RELIABLE RE-FORMATION OF A LIPID BILAYER USING A GEOMETRICALLY GUIDED AIR BUBBLE
Izumi Hashimoto[1,2], Toshihisa Osaki[2], Hirotaka Sugiura[2], Hisatoshi Mimura[2], Norihisa Miki[1,2], and Shoji Takeuchi[2,3]
[1]Keio University, JAPAN, [2]Kanagawa Institute of Industrial Science and Technology, JAPAN, and [3]University of Tokyo, JAPAN

M1C-118.a BESPOKE ASYMMETRIC LIPOSOMES TO MODEL PASSIVE DRUG TRANSPORT ACROSS RED BLOOD CELLS
Alex McDonald, Kaitlyn E.E. Ramsay, and Katherinre S. Elvira
University of Victoria, CANADA

M1A-119.a MICROFLUIDIC METHODOLOGIES FOR PRODUCTION OF SMALL-SIZED VARIOUS ARTIFICIAL EXOSOMES
Niko Kimura[1], Takuma Nomiyama[1], Toyohiro Naito[1], Masatoshi Maeki[2], Manabu Tokeshi[2], and Noritada Kaji[1]
[1]Kyushu University, JAPAN and [2]Hokkaido University, JAPAN

M1B-120.a SINGLE-CHANNEL ELECTRICAL RECORDING OF SSRA-TAGGED α-HEMOLYSIN IN A LIPID BILAYER
Tatsuhiko Hasegawa and Taishi Tonooka
Kyoto Institute of Technology, JAPAN

M1C-121.a A MICROFLUIDIC DEVICE WITH SILICON ELECTRODES FOR QUANTITATIVE EVALUATION OF VESICLE FUSION
Tsutomu Okita, Mamiko Tsugane, Keisuke Shinohara, Kosuke Kato, and Hiroaki Suzuki
Chuo University, JAPAN

T2B-217.a RAPID FABRICATION OF ARRAYED LIPID BILAYER DEVICES USING STEREOLITHOGRAPHY
Kazuto Ogishi[1], Toshihisa Osaki[2], Yuya Morimoto[1], and Shoji Takeuchi[1,2]
[1]University of Tokyo, JAPAN and [2]Kanagawa Institute of Industrial Science and Technology, JAPAN

T2C-218.a POTENTIAL MECHANISM FOR DOXORUBICIN CHEMORESISTANCE EXAMINED WITH ON-CHIP ASYMMETRIC DROPLET INTERFACE BILAYERS
Elanna B. Stephenson and Katherine S. Elvira
University of Victoria, CANADA

T2A-219.a THE ROLE OF TEMPERATURE IN THE FORMATION OF HUMAN-MIMETIC ARTIFICIAL CELL MEMBRANES USING DROPLET INTERFACE BILAYERS
Jaime L. Korner and Katherine S. Elvira
University of Victoria, CANADA

T2B-220.a CHAOTIC THERMAL CONVECTION ENABLES ASSEMBLY OF PROTOCELL-LIKE VESICLES IN MICRO-SCALE HYDROTHERMAL PORES
Vijay Ravisankar, Yassin A. Hassan, and Victor M. Ugaz
Texas A&M University, USA

T3B-323.a LIPOSOME DEFORMATION STIMULATED BY PEPTIDES
Kayano Izumi and Ryuji Kawano
Tokyo University of Agriculture and Technology, JAPAN

W4B-423.a PLASMA INACTIVATION OF VIRUS INSIDE MULTILAYERED FIBERS
Fumiharu Matsuo[1], Jun Sawayama[2], Shogo Nagata[2], Hideo Otsuki[1], Osamu Tsuji[1], and Shoji Takeuchi[2]
[1]Samco Inc., JAPAN and [2]University of Tokyo, JAPAN

W4C-424.a IMAGING MEMBRANE MICROVISCOSITY UNDER FLOW
Miguel Paez-Perez, Marina K. Kuimova, and Nicholas J. Brooks
Imperial College London, UK

a - Cells, Organisms and Organs on a Chip

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

M1A-122.a ENGINEERED HABITATS FOR *IN SITU* CHEMICAL MONITORING AND VISUALIZATION OF *POPULUS* ROOT DEVELOPMENT
Muneeba Khalid[1], Jayde Aufrecht[2], Jennifer Morrell-Falvey[1], Amber N. Bible[1], Sara Jawdy[1], John F. Cahill[1], Courtney Walton[1], Vilmos Kertesz[1], Mitchel J. Doctycz[1], and Scott T. Retterer[1]
[1]Oak Ridge National Laboratory, USA and [2]Pacific Northwest National Laboratory, USA

M1B-123.a MICROFLUIDIC-BASED CARDIAC TOXICITY ASSAY TO INVESTIGATE THE ROLE OF METAL RESPONSIVE TRANSCRIPTION FACTOR (MTF-1) IN A DROSOPHILA HEART MODEL
Alireza Zabihihesari, Shahrzad Parand, Ellen van Wijngaarden, Alistair B. Coulthard, Arthur J. Hilliker, and Pouya Rezai
York University, CANADA

M1C-124.a LOW-COST OPTOFLUIDIC ADD-ON DEVICE FOR SELECTIVE PLANE ILLUMINATION MICROSCOPY OF *C. ELEGANS* WITH A STANDARD FLUORESCENT MICROSCOPE
Mehran Behrouzi, Khaled Youssef, Pouya Rezai, and Nima Tabatabaei
York University, CANADA

M1A-125.a* MICROFLUIDIC PLATFORM FOR THE STUDY OF MULTIMODAL SENSORY INTEGRATION BASED ON *IN VIVO* FUNCTIONAL IMAGING OF *CAENORHABDITIS ELEGANS*
Sol Ah Lee[1], Yongmin Cho[2], and Hang Lu[1]
[1]Georgia Institute of Technology, USA and [2]Harvard Medical School, USA

T2C-221.a ELECTRICALLY INDUCED MOVEMENT PATTERNS IN ZEBRAFISH USING MICROFLUIDICS AND COMPUTER-AIDED ANALYSIS
Arezoo Khalili, Ellen van Wijngaarden, Georg R. Zoidl, and Pouya Rezai
York University, CANADA

T2A-222.a HYBRID NORMALLY CLOSED DRY-FILM/ELASTOMER VALVES FOR INTEGRATED ELECTROTAXIS STUDIES
Yiling Sun[1,2], Debolina Sarkar[1], Ryan Adams[1], Ayelen Tayagui[1,2], Ashley Garrill[1], and Volker Nock[1,2]
[1]University of Canterbury, NEW ZEALAND and
[2]MacDiarmid Institute for Advanced Materials and Nanotechnology, NEW ZEALAND

T2B-223.a **A SYNTHETIC SOIL HABITAT FOR PLANT-ON-A-CHIP STUDIES**
Jayde Aufrecht[1], Muneeba Khalid[2], Kylee Tate[1], Hardeep Mehta[1], and Scott Retterer[2]
[1]Pacific Northwest National Laboratory, USA and [2]Oak Ridge National Laboratory, USA

T3C-324.a **ON-CHIP INVESTIGATION OF GOLD NANOPARTICLE TOXICITY ON *C. ELEGANS* ELECTRIC EGG-LAYING**
Daphne Archonta, Khaled Youssef, Terrance J. Kubiseski, and Pouya Rezai
York University, CANADA

W4A-425.a **Poster will be presented on Tuesday, in Poster Room T2A**
BIOPHYSICAL ANALYSIS OF DRUG EFFICACY ON *C. ELEGANS* MODELS FOR NEURODEGENERATIVE AND NEUROMUSCULAR DISEASES.
Samuel Sofela[1,2], Sarah Sahloul[1], and Rafael Song[1,2]
[1]New York University, Abu Dhabi, UAE and [2]New York University, USA

W4B-426.a **ALL-GLASS NEUROEXAMINER FOR LIGHT-SHEET-IMAGING OF ZEBRAFISH BRAINS**
Dominika Schrödter, Jakob W. von Trotha, Reinhard W. Köster, Andreas Dietzel
Technische Universität Braunschweig, GERMANY

W4C-427.a **SURFACE ACOUSTIC WAVE (SAW) MICROFLUIDIC DEVICE TO INDUCE CONTROLLABLE SWIMMING EXERCISE IN *C. ELEGANS***
Nakul Sridhar, Joyita Bhadra, Ding Xue, and Xiaoyun Ding
University of Colorado, Boulder, USA

W4A-428.a **REVERSIBLE *C. ELEGANS* IMMOBILIZATION WITH SURFACE ACOUSTIC WAVES (SAW)**
Nakul Sridhar[1], Frederic J. Hoerndli[2], and Xiaoyun Ding[1]
[1]University of Colorado, Boulder, USA and [2]Colorado State University, USA

a - Cells, Organisms and Organs on a Chip

Organs on Chip

M1B-126.a ***IN SITU* DIFFERENTIATION OF HIPSCS-DERIVED TROPHOBLAST-LIKE TISSUES IN PERFUSED 3D CULTURE CHIP DEVICE**
Kangli Cui, Pengwei Deng, and Jianhua Qin
Chinese Academy of Sciences (CAS), CHINA

M1C-127.a **CORTICAL ORGANOIDS-ON-A-CHIP FOR PROBING EXOSOMES FROM BREAST CANCER CELLS INDUCED IMPAIRED NEURODEVELOPMENT**
Kangli Cui, Rongkai Cao, Wenwen Chen, Yingying Xie, Yunsong Wu, Peng Wang, and Jianhua Qin
Chinese Academy of Sciences (CAS), CHINA

M1A-128.a **MICROFLUIDIC PATTERNING OF CHONDROCYTES AND OSTEOBLASTS WITH LOCALISED OXYGEN CONTROL**
Louis Jun Ye Ong, Indira Prasadam, Jayden Lee, and Yi-Chin Toh
Queensland University of Technology, AUSTRALIA

M1B-129.a* **A MULTICHANNEL PERFUSABLE KIDNEY-ON-A-CHIP TO STUDY THE DYNAMICS OF CYST FORMATION IN POLYCYSTIC KIDNEY DISEASE**
Brice Lapin[1,2,3], Sarah Myram[1,2,3], Irène Le Moine-Caubarrère[1,2,3], Sylvie Coscoy[1,2,3], and Stéphanie Descroix[1,2,3]
[1]Institut Curie, FRANCE, [2]Sorbonne Université, FRANCE, and [3]Université PSL, FRANCE

M1C-130.a 3D SKELETAL MUSCLE-ON-CHIP: WHAT ARE THE KEY CONDITIONS REQUIRED TO BUILD A BIOMIMETIC ONE?
Manh-Louis Nguyen[1,2], Giacomo Gropplero[1,2], Lauriane Gérémie[1,2], Christine Lansche[1], Fabrice Soncin[3], Maria-Carla Parrini[1], and Stéphanie Descroix[1,2]
[1]Institut Curie, FRANCE, [2]Institut Pierre Gilles de Gennes pour la Microfluidique, Paris, FRANCE, and [3]INSERM, CNRS, UMI2820, LIMMS/IIS, FRANCE

M1A-131.a* ENGINEERED FUNCTIONAL 3D MICROVASCULATURE-ON-CHIP TO STUDY LEUKOCYTE ENDOTHELIUM INTERACTION AND VASCULAR INFLAMMATION
Wuji Cao, Elisabeth Hirth, Edo Kapetanovic, and Petra Dittrich
ETH Zürich, SWITZERLAND

M1B-132.a* RECAPITULATING DENDRITIC CELL CHEMOTAXIS TOWARD LYMPHATIC VESSEL USING IN VITRO HUMAN 3D INFLAMMATION MODEL
Hyeonsu Jo[1], Somin Lee[1], Inae Park[2], Junsang Doh[1], and Noo Li Jeon[1]
[1]Seoul National University, KOREA and [2]Pohang University of Science and Technology, KOREA

M1C-133.a A CO-CULTURE SYSTEM OF HUMAN SKIN EQUIVALENT AND DOSAL ROOT GANGLION NEURONS
Satoshi Inagaki, Kazuo Emoto, Yuya Morimoto, and Shoji Takeuchi
University of Tokyo, JAPAN

M1A-134.a BIOMICROFLUIDIC SYSTEMS WITH TRANSVERSE AND NORMAL DIFFUSIONAL ENVIRONMENTS FOR MULTIDIRECTIONAL SIGNALLING
Michael D. Mohan and Edmond W.K. Young
University of Toronto, CANADA

M1B-135.a ANGIO- AND VASCULOGENESIS UNDER MECHANICAL AND BIOCHEMICAL STIMULI IN A COMPLEX MICROVASCULATURE ON CHIP
Dario Ferrari[1], Soheila Zeinali[1], and Olivier T. Guenat[1,2]
[1]University of Bern, SWITZERLAND and [2]University Hospital of Bern, SWITZERLAND

M1C-136.a MULTI-FUNCTIONAL CARDIAC MICROPHYSIOLOGICAL CHIP FOR CARDIOTOXICITY APPLICATIONS
Kai Niu, Ding Wang, Qinyu Li, and Xiaolin Wang
Shanghai Jiao Tong University, CHINA

M1A-137.a A NOVEL HYBRID INTEGRATED 3D TUMOR-ON-CHIP PLATFORM FOR VERSATILE, HIGH-THROUGHPUT SCALABLE APPLICATIONS
Simrit Safarulla, Vikram Surendran, and Arvind Chandrasekaran
North Carolina A&T University, USA

M1B-138.a DIALYSIS MEMBRANE-INTEGRATED MICROPHYSIOLOGICAL SYSTEM FOR MAINTAINING CELL CULTURE ENVIRONMENT
Yuya Ito, Kenta Shinha, and Hiroshi Kimura
Tokai University, JAPAN

M1C-139.a TUMOR-ON-CHIP MODEL TOWARD A BETTER UNDERSTANDING OF NANOPARTICLE-MEDIATED PHOTOTHERMIA COMBINED WITH CHEMOTHERAPY
Charles Cavaniol[1], Mélik Maksem[2], Giacomo Gropplero[1], Aurore Van de Walle[1], Yoann Lalatonne[2], Stéphanie Descroix[1], and Claire Wilhelm[1]
[1]Institut Curie, FRANCE and [2]Hôpital Avicennes APHP, FRANCE

T2C-224.a INVESTIGATING THE IMPACT OF MECHANICAL STIMULATION ON THE AGGRESSIVENESS OF BREAST CANCER
Carlo Alberto Paggi, Agnieszka Zuchowska, and Séverine Le Gac
University of Twente, NETHERLANDS

T2A-225.a INVESTIGATING END-STAGE OSTEAORTHITIC CARTILAGE AND CHONDROSARCOMA RESPONSE TO MECHANICAL STIMULATION
Carlo Alberto Paggi, Isa Porsul, Jacqueline R.M. Plass, Marcel Karperien, and Séverine Le Gac
University of Twente, NETHERLANDS

T2B-226.a MULTI-ORGAN COMMUNICATION DEVICE TO STUDY NEUROIMMUNE SIGNALING IN THE GUT
Lauren DeLong and Ashley E. Ross
University of Cincinnati, USA

T2C-227.a A MICROFLUIDIC BLOOD-BRAIN BARRIER CHIP FOR INVESTIGATION OF CELL INTERACTIONS UNDER NEUROINFLAMMATION
Yu-Lian Zeng[1], Yang Du[2], Xin-Xin Xu[2], Wei Liu[2], Yuhui Shen[1], Yan Luo[1], and Yan-Jun Liu[2]
[1]Shanghai Jiaotong University, CHINA and [2]Fudan University, CHINA

T2A-228.a VASCULARIZED OSTEOSARCOMA MODEL FOR CELL MIGRATION AND ANGIOGENESIS STUDY
Yang Du[1], Qi Liu[2], Yu-Lian Zeng[2], Wei Liu[1], Ya-Jun Wang[1], Sai-Xi Yu[1], Yi Wu[1], Yu-Chen Chen[1], Xin-Xin Xu[1], Yuhui Shen[2], and Yan-Jun Liu[1]
[1]Fudan University, CHINA and [2]Shanghai Jiaotong University School of Medicine, CHINA

T2B-229.a EVALUATION OF ALBUMIN PRODUCTION AND PHENACETIN METABOLISM IN A VASCULARIZED MICRO LIVER
Satomi Matsumoto, Jennifer S. Fang, Yu-Hsi Chen, Abraham P. Lee, and Christopher C.W. Hughes
University of California, Irvine, USA

T2C-230.a DISSOLVABLE TEMPORARY BARRIER FOR ROBUST HYDROGEL PATTERNING AND UNIFORM MEDIUM PERFUION IN ORGAN-ON-A-CHIP APPLICATIONS
Ding Wang, Qinyu Li, Kai Niu, and Xiaolin Wang
Shanghai Jiao Tong University, CHINA

T2A-231.a LIVER-ON-A-CHIP: TOWARDS EMULATION OF DRUG METABOLISM IN A MICROFLUIDIC PLATFORM
Gulsim Kulsharova, Akbota Kurmangaliyeva, Galiya Toxeitova, Elvira Darbayeva, Aidos Baumuratov, and Luis Rojas-Solórzano
Nazarbayev University, KAZAKHSTAN

T2B-232.a A MICROFLUIDIC DEVICE FOR CULTURING INTACT LIVER TISSUE
Jose M. de Hoyos-Vega, Hye Jin Hong, Gulnaz Stybayeva, and Alexander Revzin
Mayo Clinic, USA

T2C-233.a "ON-CHIP VASCULAR BED" SYSTEM TO INVESTIGATE VASCULARIZATION AND METASTASIS OF ALVEOLAR SOFT PART SARCOMA
Yoshikazu Kameda[1], Surachada Chuaychob[1], Miwa Tanaka[2], Takuro Nakamura[2], Kazuya Fujimoto[1], and Ryuji Yokokawa[1]
[1]Kyoto University, JAPAN and [2]Japanese Foundation for Cancer Research, JAPAN

T2A-234.a EVALUATION OF ORGANS INTERACTION USING A COCULTURE PUMP PLATE
Kenta Shinha[1], Wataru Nihei[2], Hiroko Nakamura[1], Takumi Kawanishi[3], Hiroshi Arakawa[3], Kousuke Inamura[4], Masaki Nishikawa[4], Yukio Kato[3], Yasuyuki Sakai[4], and Hiroshi Kimura[1]
[1]Tokai University, JAPAN, [2]Aichi Gakuin University, JAPAN, [3]Kanazawa University, JAPAN, and [4]University of Tokyo, JAPAN

T2B-235.a NEW PC-PDMS-PC MICROSYSTEM WITH ALIGNED NANOFIBROUS MATS TO STUDY HEART DISEASES
Dominik Kolodziejek, Michal Wojasinski, Katarzyna Kociszewska, Kamil Zukowski, Zbigniew Brzozka, and Elzbieta Jastrzebska
Warsaw University of Technology, POLAND

T3A-325.a A TROPHOBLAST STEM CELL-BASED MODEL OF THE HUMAN PLACENTAL BARRIER
Takeshi Hori, Hiroaki Okae, Norio Kobayashi, Takahiro Arima, and Hirokazu Kaji
Tohoku University, JAPAN

T3B-326.a A MICROTUMOR MODEL WITH ANGIOGENIC SPROUTED VESSELS FOR THE APPLICATION OF DRUG SCREENING
Yi-Ting Chen and Yu-Hsiang Hsu
National Taiwan University, TAIWAN

T3C-327.a FABRICATION OF A MODULAR IN VITRO HUMAN ARTERY-MIMICKING MULTICHANNEL SYSTEM TO STUDY VASCULAR INFLAMMATION
Minkyung Cho, Gihyun Lee, Dong Hyun Han, and Je-Kyun Park
Korea Advanced Institute of Science and Technology (KAIST), KOREA

T3A-328.a CONSTRUCTION OF PANCREATIC ISLET-LIVER MULTI-ORGANOID-ON-CHIP SYSTEM FROM HIPSCS
Ting-ting Tao[1,2], Peng-wei Deng[1,2], Ya-qing Wang[1,2], Xu Zhang[1], Ya-qiong Guo[1,2], Wen-wen Chen[1,2], and Jian-hua Qin[1,2]
[1]Chinese Academy of Sciences (CAS), CHINA and [2]University of Chinese Academy of Sciences, CHINA

T3B-329.a CONDENSED ECM COATED TE MEMBRANE FOR A VERSATILE MICROPHYSIOLOGICAL SYSTEM TO STUDY ROBUST INTERCELLULAR COMMUNICATIONS
Brian Choi[1], Jeong-Won Choi, Hyungwon Jin, Hye-Rim Sim, Jung-Hoon Park, Tae-Eun Park, and Joo H. Kang
Ulsan National Institute of Science and Technology (UNIST), KOREA

T3C-330.a ESTABLISHING A KIDNEY PODOCYTE-PEC CROSSTALK MODEL USING OPEN MICROFLUIDICS
Yuting Zeng, Jeffrey W. Pippin, Stuart J. Shankland, and Ashleigh B. Theberge
University of Washington, Seattle, USA

T3A-331.a ON-CHIP VASCULAR WOUNDING WITH MICROACTUATOR AND MONITORING WITH ELECTRICAL IMPEDANCE
Halston E. Deal, Jack S. Twiddy, Ashley C. Brown, and Michael A. Daniele
North Carolina State University, USA

T3B-332.a A MICROFLUIDIC AND MICROPATTERNED CO-CULTURE HUMAN LIVER PLATFORM FOR DRUG METABOLISM AND TOXICITY TESTING
Yong Duk Han and Salman Khetani
University of Illinois, Chicago, USA

T3C-333.a NOVEL HIGH-THROUGHPUT HEART-ON-A-CHIP PLATFORM WITH MEA AND STRAIN SENSORS FOR ELECTRO-MECHANICAL SENSING
Pooja P. Kanade, Dong-Su Kim, Nomin-Erdene Oyunbaatar, and Dong-Weon Lee
Chonnam National University, KOREA

T3A-334.a THREE-DIMENSIONAL LIQUID PATTERNING WITH MICROMESH STRUCTURE BY 3D PRINTING FABRICATION
Suryong Kim, Byungjun Lee, and Noo Li Jeon
Seoul National University, KOREA

T3B-335.a **OPTIMIZING GROWTH FACTOR COMBINATIONS FOR PERFUSABLE MICROVASCULATURE-ON-A-CHIP**
Taiga Irisa, Maneesha Shaji, Yoshikazu Kameda, Kazuya Fujimoto, Stanislav L. Karsten, and Ryuji Yokokawa
Kyoto University, JAPAN

T3C-336.a **EVALUATION OF PERMEABILITY AND PAN TOXICITY OF CELL BARRIERS CONSTITUTED OF KIDNEY ORGANOID-DERIVED GLOMERULUS**
Ayumu Tabuchi[1], Shozan Watabe[1], Kensuke Yabuuchi[2,3], Yoshiki Sahara[2], Minoru Takasato[1,2], Kazuya Fujimoto[1], Stanislav L. Karsten[1], and Ryuji Yokokawa[1]
[1]Kyoto University, JAPAN, [2]RIKEN, JAPAN, and [3]Osaka University, JAPAN

W4B-429.a* **'BARRIER-ON-A-CHIP' FOR REAL TIME IMPEDANCE MONITORING OF EPITHELIAL BARRIER FUNCTION**
Joao Fernandes, Nikita Karra, Joel Bowring, Riccardo Reale, Emily Swindle, and Hywel Morgan
University of Southampton, UK

W4C-430.a **TRANSIENT DISRUPTION OF A BLOOD-BRAIN BARRIER ON-CHIP USING FOCUSED ULTRASOUND AND MONODISPERSE MICROBUBBLES**
Mariia Zakharova, Pieter A.M. Persijn van Meerten, Martin R.P. van den Broek, Loes I. Segerink, and Tim Segers
University of Twente, NETHERLANDS

W4A-431.a **HANGING-DROP-BASED, 3D BLOOD-BRAIN-BARRIER MODEL**
Wei Wei, Andreas Hierlemann, Mario M. Modena
ETH Zürich, SWITZERLAND

W4B-432.a **DEVELOPMENT OF A MICROFLUIDIC PLATFORM FOR LONG-TERM CULTURE OF TISSUE WITH VARIABLE OXYGEN TENSIONS**
Fernando C. Garcia, Emily J. Swindle, and Hywel Morgan
University of Southampton, UK

W4C-433.a **MICROFLUIDIC DEVICE INTEGRATING FUNCTIONAL ENDOTHELIAL NETWORKS AND AUTOMATIC FLUID HANDLING WITH VALVES**
Clément Quintard[1], Camille Laporte[1], Gustav Jonsson[2], Caroline Bissardon[1], Amandine Pitaval[1], Alexandra Leopoldi[2], Pierre Blandin[1], Jean-Luc Achard[1,3], Josef M. Penninger[2,4], Fabrice P. Navarro[1], Yves Fouillet[1], and Xavier Gidrol[1]
[1]Université Grenoble Alpes, FRANCE, [2]Institute of Molecular Biotechnology of the Austrian Academy of Sciences, AUSTRIA, [3]CNRS LEGI, FRANCE, and [4]University of British Columbia, CANADA

W4A-434.a **A SYNOVIAL MEMBRANE-ON-CHIP STUDYING THE DEVELOPMENT OF RHEUMATHOID ARHRITIS IN A TRIPLE CULTURE SYSTEM**
Carlo Alberto Paggi, Nuno Araújo-Gomes, Agnieszka Zuchowska, Marcel Karperien, and Séverine Le Gac
University of Twente, NETHERLANDS

W4B-435.a* **A HIGH-THROUGHPUT OXYGEN SENSOR-INTEGRATED ORGAN-ON-CHIP PLATFORM FOR LABEL-FREE AND REAL-TIME MONITORING OF TISSUE METABOLIC FUNCTION**
Samuel H. Kann[1,2], Erin M. Shaughnessey[2,3], Else M. Vedula[2], Xin Zhang[1], and Joseph L. Charest[2]
[1]Boston University, USA, [2]Charles Stark Draper Laboratory Inc., USA, and [3]Tufts University, USA

W4C-436.a **A DENSELY STACKED MICROFLUIDIC OXYGENATOR WITH HIGH CO_2 RELEASE EFFICIENCY**
Julie Lachaux[1], Gilgueng Hwang[1], Abdelmounaim Harouri[1], Jean-Baptiste Menager[2], Justin Issard[2], Julien Guihaire[2], Olaf Mercier[2], and Anne-Marie Haghiri Gosnet[1]
[1]CNRS, FRANCE and [2]HML, Marie Lannelongue Hospital, FRANCE

W4A-437.a RAPID ORGAN-ON-A-CHIP VASCULARIZATION ACTIVATED BY FIBROBLAST AGGREGATES
Agnieszka Zuchowska, Carlo Alberto Paggi, and Séverine Le Gac
University of Twente, NETHERLANDS

W4B-438.a MODELLING THE BIOPHYSICS OF PANCREATIC DUCTAL ADENOCARCINOMA ON-CHIP FOR EFFECTIVE THERAPEUTIC ASSESSMENT
Delanyo Kpeglo[1], Margaret Knowles[1], Malcolm Haddrick[2], Stephen D. Evans[1], and Sally A. Peyman[1]
[1]University of Leeds, UK and [2]Medicines Discovery Catapult, UK

W4C-439.a CYCLIC EXPOSURE TO COMPRESSIVE FORCES INCREASES THE DIFFERENTIATION EFFICIENCY OF HIPSCS TOWARDS CHONDROCYTES IN A CARTILAGE-ON-CHIP PLATFORM
Tomas van Dorp, Carlo Alberto Paggi, Rolf Slaats, Verena Schwach, Séverine Le Gac, Robert Passier, and Marcel Karperien
University of Twente, NETHERLANDS

W4A-440.a STUDYING THE IMPACT OF NANOPLASTICS ON THE INTEGRITY OF THE BLOOD-EPIDIDYMIS BARRIER
Eleftheria Stoimenou[1], Kirsten Pondman[1], Thomas Burgers[1], Bastien Venzac[1], Swati Sharma[2], Stefan Schlatt[2], and Séverine Le Gac[1]
[1]University of Twente, NETHERLANDS and [2]Centre for Reproductive Medicine and Andrology, GERMANY

W4B-441.a* IMPLEMENTING A BLOOD-BRAIN BARRIER ON A CHIP TO EXPLORE THE EFFECTS OF ERYTHROCYTES ON AGING
Payam Amiri[1], Jonalyn DeCastro[1], Joshua Littig[1], Hsiang-Wei Lu[1], Chao Lui[2], Irina Conboy[2], and Kiana Aran[1,2]
[1]Keck Graduate Institute, USA and [2]University of California, Berkeley, USA

W4C-442.a ORGAN-ON-A-CHIP MEETS HIGH THROUGHPUT SCREENING: MEASURING TRANS ENDOTHELIAL ELECTRICAL RESITANCE
Arnaud Nicolas[1,2], Frederik Schavemaker[1], Gwenaëlle Rabussier[1], Sebastiaan Trietsch[1], Henriette Lanz[1], and Paul Vulto[1]
[1]Mimetas B.V., NETHERLANDS and [2]Leiden Academic Centre for Drug Research (LACDR), NETHERLANDS

W4A-443.a* REAL-TIME, IN-LINE MONITORING OF OXYGEN-DEPENDENT METABOLISM OF MOUSE PRECISION-CUT LIVER SLICES INCUBATED IN A MICROFLUIDIC DEVICE
Ruby E.H. Karsten, Maciej Grajewski, Jean-Paul S.H. Mulder, Peter Olinga, and Elisabeth Verpoorte
University of Groningen, NETHERLANDS

a - Cells, Organisms and Organs on a Chip
Single-Cell Analysis

M1A-140.a SPHEROCYTES FLOW BEHAVIOURS IN MICRORESTRICTION, COMPARED BY NORMAL RED BLOOD CELLS OF DIFFERENT HEAT TREATMENT LEVELS
Tieying Xu[1], Maria A. Lizarralde-Iragorri[2], Jean Roman[1], Emile Martincic[3], Valentine Brousse[2], Olivier Français[3], Wassim El Nemer[2], and Bruno Le Pioufle[1]
[1]Université Paris-Saclay, FRANCE, [2]Université de Paris, FRANCE, and [3]Université Gustave Eiffel, FRANCE

M1B-141.a DIFFERENT MINIATURIZATION SYSTEMS OF ELECTRICAL BIOSENSING AND DATA ACQUISITION DURING BIOLOGICAL CELL TRANSITING WITHIN VESSEL SIZE MICROCHANNEL
Tieying Xu[1], Maria A. Lizarralde-Iragorri[2], Jean Roman[1], Emile Martincic[1], Valentine Brousse[2], Wassim El Nemer[2], Olivier Français[3], and Bruno Le Pioufle[1]
[1]Université Paris-Saclay, FRANCE, [2]Université de Paris, FRANCE, and [3]Université Gustave Eiffel, FRANCE

M1C-142.a* **SCALABLE FABRICATION OF 3D STRUCTURED MICROPARTICLES USING INDUCED PHASE SEPARATION**
Sohyung Lee, Joe de Rutte, Robert Dimatteo, Doyeon Koo, and Dino Di Carlo
University of California, Los Angeles, USA

M1A-143.a* **CAMERA-FREE HIGH-THROUGHPUT SINGLE-CELL INTRINSIC MECHANICAL CHARACTERIZATION UTILIZING IMPEDANCE FLOW CYTOMETRY**
Yongxiang Feng, Huichao Chai, Fei Liang, and Wenhui Wang
Tsinghua University, CHINA

M1B-144.a* **3D SINGLE CELL TOMOGRAPHIC IMAGING FOR REFRACTIVE-INDEX BASED CELLULAR CHARACTERIZATION**
Fei Liang, Yongxiang Feng, Huichao Chai, Wenan Liao, Xujun Ma, and Wenhui Wang
Tsinghua University, CHINA

M1C-145.a* **STABLE AND SCALABLE ENGINEERING OF HUMAN PRIMARY T CELLS VIA MICROFLUIDIC CELL STRETCHING**
Jeongsoo Hur and Aram Chung
Korea University, KOREA

M1A-146.a **MOORING BOTH ENDS OF INTACT CHROMATIN FIBERS TO MICROSTRUCTURES IN A MICROFLUIDIC DEVICE FOR ACQUISITION OF EPIGENETIC INFORMATION BASED ON FLUORESCENCE MICROSCOPY**
Kiyonori Noda and Hidehiro Oana
University of Tokyo, JAPAN

M1B-147.a **MICROFLUIDIC DEVICE FOR ANALYSIS OF CYTOKINE SECRETION FROM SINGLE CELLS USING MICROBEADS**
Diana F. Cedillo-Alcantar, Roberto Rodriguez-Moncayo, and Jose L. García-Cordero
Cinvestav, MEXICO

M1C-148.a **MASSIVELY MULTIPLEXED SINGLE-CELL ELECTROPHYSIOLOGY WITH NANOSCALE RESOLUTION**
Ahsan Habib[1], Xiangchao Zhu[1], Uryan I. Can[2], Maverick L. McLanahan[1], Pinar Zorlutuna[2], A. Ali Yanik[1]
[1]University of California, Santa Cruz, USA and [2]University of Notre Dame, USA

M1A-149.a **EXPERIMENTAL STUDY OF SHAPE DEPENDENT CELL MOTIONS IN MICROFLUIDIC FLOW**
David Dannhauser[1], Maria I. Maremonti[1], Paolo A. Netti[1,2], and Filippo Causa[1]
[1]University of Naples Federico II, ITALY and [2]Istituto Italiano Di Tecnologia, ITALY

M1B-150.a **SINGLE CELL MICROARRAY WITH OVERHANG WELLS FOR ANALYZING CALCIUM RESPONSE**
Ryota Sano[1], Kentaro Koyama[1], Narumi Fukuoka[1], Hidetaka Ueno[2], Shohei Yamamura[2], and Takaaki Suzuki[1]
[1]Gunma University, JAPAN and [2]National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

M1B-445.a* **HIGH-THROUGHPUT FULL-LENGTH SINGLE-CELL RNA SEQUENCING BASED ON DROPLET MICROFLUIDICS**
Zirui Zhou, Qiang Zhang, and Chang Lu
Virginia Tech, USA

M1B-450.a* **MICROFLUIDIC PLATFORM FOR THE IDENTIFICATION AND RETRIEVAL OF SINGLE DRUG-TOLERANT YEAST CELLS**
Jolien Breukers, Caroline Struyfs, Karen Ven, Iene Rutten, Dragana Spasic, Karin Thevissen, Bruno P.A. Cammue, and Jeroen Lammertyn
Katholieke Universiteit Leuven, BELGIUM

T2C-236.a A MICROFLUIDIC SYSTEM ENABLING HIGH-THROUGHPUT QUANTITATIVE MEASUREMENTS OF SINGLE-CELL PROTEINS
Lixing Liu[1,2], Ting Zhang[1,2], Guang Yang[1,2], Yixiang Wang[3], Deyong Chen[1,2], Junbo Wang[1,2], and Jian Chen[1,2]
[1]Chinese Academy of Sciences (CAS), CHINA,[2]University of Chinese Academy of Sciences, CHINA, and [3]Peking University Hospital of Stomatology, CHINA

T2A-237.a SINGLE CELL DEFORMABILITY PHENOTYPING BY IMPEDANCE CYTOMETRY
Junyu Chen, Nikita Karra, Daniel Spencer, and Hywel Morgan
University of Southampton, UK

T2B-238.a MEASURING HOW CLOCKS IN SINGLE CELLS OF *NEUROSPORA CRASSA* COMMUNICATE IN MICROFLUIDIC DEVICES
Jia Hwei Cheong, Xiao Qiu, Yang Liu, James Griffith, Heinz-Bernd Schüttler, Jonathan Arnold, and Leidong Mao
University of Georgia, USA

T2C-239.a MAPPING THE THERMORESPONSES OF MICROALGAE BY INTEGRATING SINGLE-CELL ARRAYS ON A PROGRAMMABLE TEMPERATURE STAGE
Sofia Johansson, Linhong Xiao, Martin Andersson, Henrik Bergman, Lars Behrendt, and Maria Tenje
Uppsala University, SWEDEN

T2A-240.a SELECTIVE DNA HYDROGEL MICROCAPSULES FOR FACILE AND HIGH-THROUGHPUT MANIPULATION OF CIRCULATING TUMOR CELLS
Shuguang Xuan, Hongtao Feng, Yuqing Huang, and Yan Chen
Chinese Academy of Sciences (CAS), CHINA

T2B-241.a MULTIPLEXED DNA-DIRECTED PATTERNING OF ANTIBODIES FOR SINGLE-CELL SURFACE MARKER ANALYSIS
Molly Kozminsky, Olivia J. Scheideler, Brian Li, Nathaniel K. Liu, and Lydia L. Sohn
University of California, Berkeley, USA

T2C-242.a CHARACTERIZATION OF EXTRACELLULAR VESICLES BY RESISTIVE-PULSE SENSING ON IN-PLANE MULTIPORE NANOFLUIDIC DEVICES
Tanner Young and Stephen C. Jacobson
Indiana University, USA

T2A-243.a IN-DROPLET RAPID AND SENSITIVE DETECTION OF BETA-GALACTOSIDASE ENZYME BY ION CONCENTRATION POLARIZATION MEDIATED CELL LYSIS AND ENRICHMENT
Aparna Krishnamurthy, Sungu Kim, Baskar Ganapathysubramanian, and Robbyn K. Anand
Iowa State University, USA

T2B-244.a DIELECTROPHORETIC RESPONSES OF MICROALGAE *CHLORELLA VULGARIS* WITH ALGAL-SYNTHESIZED GOLD NANOPARTICLES
Yu-Sheng Lin[1,2], Kuan-Yu Chen[1], and Hsiang-Yu Wang[1]
[1]National Tsing Hua University, TAIWAN and [2]Université Paris-Saclay, FRANCE

T2C-245.a CHARACTERIZATION OF NECROTIC AND VIABLE SPERMATOZOA IN MICROFLUIDIC IMPEDANCE CYTOMETRY
Stella A. Kruit, Douwe S. de Bruijn, Wouter Olthuis, and Loes I. Segerink
University of Twente, NETHERLANDS

T3A-337.a MULTIPLEXED LIVE CELL TEMPOROSPATIAL IMAGING USING ULTRAFAST CYCLING
Jina Ko, Eva Bolli, Mikael Pittet, David Sykes, Ralph Weissleder, and Jonathan Carlson
Massachusetts General Hospital, USA

T3B-338.a THIN INTEGRATED VALVE MICROFLUIDIC DEVICE FOR SINGLE CELL MULTI-OMICS
Soohong Kim[1,2], Gabriel Dorlhiac[2], Rodrigo Cotrim Chaves[2], and Aaron Streets[2,3]
[1]Ningbo University, CHINA, [2]University of California, Berkeley, USA, and [3]Chan Zuckerberg Biohub, USA

T3C-339.a RETRIEVAL OF STATIC DROPLETS: A STEP TOWARDS SINGLE-CELL ANALYSIS OF RARE CELLS
Payar Radfar[1], Lin Ding[1], Meysam Rezaei[2], and Majid Ebrahimi Warkiani[1]
[1]University of Technology Sydney, AUSTRALIA and [2]Genea, AUSTRALIA

T3A-340.a A MICROFLUIDIC APPROACH TO DETECT HETEROGENOUS ALKALINE PHOSPHATASE ACTIVITY IN SINGLE *CHLAMYDOMONAS REINHARDTII* CELLS
Alireza Rahnama, Manibarathi Vaithiyanathan, Travis M. Dugas, Kelly L. Yates, and Adam T. Melvin
Louisiana State University, USA

T3B-341.a CALCIFICATION STATE OF ALGAE STUDIED WITH IMPEDANCE FLOW CYTOMETRY
Douwe S. de Bruijn[1], Paul M. ter Braak[1], Dedmer B. Van de Waal[2], Johan G. Bomer[1],
Wouter Olthuis[1], and Albert van den Berg[1]
[1]University of Twente, NETHERLANDS and
[2]Netherlands Institute of Ecology (NIOO-KNAW), NETHERLANDS

T3C-342.a A SIMULTANEOUS ELECTROROTATION TO MONITOR DIELECTRIC PROPERIES OF CELLS STIMULATED BY IONOPHORE
Masato Suzuki, Shikiho Kawai, and Tomoyuki Yasukawa
University of Hyogo, JAPAN

T3A-343.a HIGH-THROUGHPUT PIPELINE FOR POLYDISPERSE DROPLET ANALYSIS
Immanuel Sanka, Simona Bartkova, Pille Pata, Olli-Pekka Smolander, and Ott Scheler
Tallinn University of Technology, ESTONIA

T3B-344.a THE APPLICATION OF A MICROFLUIDIC DEVICE TO MEASURE DRUG UPTAKE TIME INTO LIVING CELLS ON AN ULTRASHORT TIMESCALE
Marta Pilz, Francesco Nalin, Karina Kwapiszewska, Karol Makuch, Ladislav Derzsi, Piotr Garstecki,
and Robert Holyst
Polish Academy of Sciences, POLAND

T3C-345.a TECHNICAL ARTIFACTS IN DROPLET-MICROFLUIDICS-BASED SINGLE-NUCLEI RNA-SEQUENCING
Anushka Gupta[1] and Aaron Streets[2]
[1]University of British Columbia, USA and [2]Chan Zuckerberg Biohub, USA

T3A-346.a AN INJECTION MOLDED MICROFLUIDIC PLATFORM TO GENERATE SPATIOTEMPORAL DYNAMICS FOR SINGLE-CELL ANALYSIS
Youngtaek Kim and Noo Li Jeon
Seoul National University, KOREA

T3B-347.a RARE CELLS ISOLATION ON SACA CHIP COMBINING GELATION AND AUTOMATIC PICK-UP FOR CLEAN SINGLE CELL ANALYSIS
Hsin-Yu Yang, Yi-Wen Hu, Chih-Hsuan Chien, and Fan-Gang Tseng
National Tsing Hua University, TAIWAN

W4B-444.a MICROFLUIDIC PLATFORM OF MEASURING SINGLE-CELL CORTICAL TENSION/SPECIFIC MEMBRANE CAPACITANCE AND CYTOPLASMIC CONDUCTIVITY
Yan Liu[1,2], Ke Wang[3], Xiaohao Sun[4], Deyong Chen[1,2], Junbo Wang[1,2], and Jian Chen[1,2]
[1]Chinese Academy of Sciences (CAS), CHINA, [2]University of Chinese Academy of Sciences, CHINA,
[3]Beijing University of Posts and Telecommunications, CHINA, and [4]University of Colorado Boulder, USA

W4A-446.a SELECTIVE RETRIEVAL OF SINGLE HYBRIDOMAS SECRETING TARGET ANTIBODY USING MICROWELL ARRAY DEVICES COMBINED WITH DIELECTROPHORESIS
Misaki Hata, Masato Suzuki, and Tomoyuki Yasukawa
University of Hyogo, JAPAN

W4B-447.a LARGE-SCALE SINGLE-CELL PAIRING AND FUSION FOR HYBRIDOMA PRODUCTION
Do-Hyun Lee and Joel Voldman
Massachusetts Institute of Technology, USA

W4C-448.a LASER-INDUCED DEEP ETCHING OF GLASS FOR LIVE CELL ASSAYS
Niklas Sandström[1], Ludwig Brandt[1], Patrick Sandoz[1], Chiara Zambarda[1], Karolin Guldevall[1], Malte Schulz-Ruhtenberg[2], Bernd Rösener[2], Robin A. Krüger[2], and Björn Önfelt[1]
[1]KTH Royal Institute of Technology, SWEDEN and [2]LPKF Laser & Electronics AG, GERMANY

W4A-449.a ISOLATED CULTURE OF SINGLE BACTERIAL CELLS USING A MODIFIED MOTHER MACHINE
Fumiaki Yokoyama and Petra S. Dittrich
ETH Zürich, SWITZERLAND

W4C-451.a OPTICAL AND MECHANICAL PHENOTYPING OF HUMAN B AND T CELLS
Antoine Leblanc-Hotte[1,2,3], Geneviève Chabot-Roy[1], Joaquin Ernesto Fajardo-Despaigne[1], Jean-Sébastien Delisle[1,2], Yves-Alain Peter[3], and Sylvie Lesage[1,2]
[1]Maisonneuve-Rosemont Hospital Research Centre, CANADA, [2]University of Montréal, CANADA, and [3]Polytechnique Montréal, CANADA

W4A-452.a DRUG-INDUCED MODULATION OF MACROPHAGE ACTIVATION BY *EX VIVO* HERNIATED DISCS MEASURED BY IMPEDANCE CYTOMETRY
Armita Salahi, Aditya Rane, Li Xiao, Carlos Honrado, Li Jin, Xudong Li, and Nathan Swami
University of Virginia, USA

W4B-453.a CO-CULTURE DEVICE FOR SINGLE NEURON ANALYSIS USING A MICROPOROUS SIN MEMBRANE
Ayaka Nakama and Takashi Yasuda
Kyushu Institute of Technology, JAPAN

W4C-454.a REALTIME UNCERTAINTY QUANTIFICATION VIA ULTRA-PRECISE PARTICLE MATCHING FOR HIGH-THROUGHPUT SERIAL CYTOMETRY
Matthew DiSalvo[1,2], Paul N. Patrone[2], and Gregory A. Cooksey[2]
[1]Johns Hopkins University, USA and [2]National Institute of Standards and Technology (NIST), USA

W4A-455.a SINGLE-CELL MECHANICAL PHENOTYPING AS A NOVEL APPROACH FOR ANALYZING ADIPOCYTE BROWNING
Nathaniel Liu, Priya Vijayakumar, and Lydia L. Sohn
University of California, Berkeley, USA

W4B-456.a MICROWELL ARRAY DEVICES FOR PHOSPHOLIPIDS IMAGING IN SINGLE CELLS BY SCANNING PROBE ELECTROSPRAY IONIZATION MASS SPECTROMETRY
Toshihiro Ito[1], Toyohiro Naito[1], Hikari Terada[2], Yoichi Otsuka[2], Niko Kimura[1], and Noritada Kaji[1]
[1]Kyushu University, JAPAN and [2]Osaka University, JAPAN

W4C-457.a A MAGNETICALLY AND ELECTRICALLY POWERED HYBRID MICROMOTOR IN CONDUCTIVE SOLUTIONS
Yue Wu, Sivan Yakov, and Gilad Yossifon
Technion–Israel Institute of Technology, ISRAEL

a - Cells, Organisms and Organs on a Chip
Synthetic Biology

T2A-246.a INVESTIGATION OF ION PERMEABILITY OF MUTANT NANOPORE-FORMING PROTEIN FOR BIOLOGICAL SENSING USING A PATCH CLAMP METHOD OF THE ARTIFICIAL LIPID BILAYER
Toshiyuki Tosaka and Koki Kamiya
Gunma University, JAPAN

T3C-348.a NEXT GENERATION INSTRUMENT FOR HIGH-THROUGHPUT GENE EDITING
Ryan Montes, An-Angela Van, Ik Pyo Hong, Eduardo Cervantes, Foteini Christodoulou, and Mais Jebrail
Miroculus, USA

T3A-349.a DNA-MEDIATED ADHESION OF GIANT LIPOSOMES WITH CELLS TOWARDS THE TRANSPLANTATION OF ARTIFICIAL ORGANELLES
Sho Takamori[1], Hisatoshi Mimura[1], Toshihisa Osaki[1], and Shoji Takeuchi[1,2]
[1]Kanagawa Institute of Industrial Science and Technology, JAPAN and [2]University of Tokyo, JAPAN

W4A-458.a XPORT ENTRAP: A DROPLET MICROFLUIDIC PLATFORM FOR ENHANCED DNA TRANSFER BETWEEN MICROBIAL SPECIES
Jose A. Wippold[1], Monica Chu[1], Bryn Adams[1], and Arum Han[2]
[1]U.S. Army Research Lab, USA and [2]Texas A&M University, USA

a - Cells, Organisms and Organs on a Chip
Other Applications in Biology

M1C-151.a CONCAVE PORTION FOR ACCURATE MEASUREMENT OF FLUORESCENCE IN MICROPHYSIOLOGICAL SYSTEM
Kotaro Doi[1], Hiroshi Kimura[2], Masaomi Nangaku[1], Yukiko T. Matsunaga[1], and Teruo Fujii[1]
[1]University of Tokyo, JAPAN and [2]Tokai University, JAPAN

M1A-152.a ENGINEERING OF THE MAMMALIAN CELLS WITH HAND-HELD MICROFILTROPORATION PLATFORM
Dorsa Morshedi Rad[1], Ziyao Zhang[1], and Majid Ebrahimi Warkiani[1,2]
[1]University of Technology Sydney, AUSTRALIA and [2]Sechenov University, RUSSIA

T2B-247.a MiCoMo: A MINIATURE MULTI-BIOREACTOR SYSTEM FOR INVESTIGATION OF GUT MICROBIOME
Zijie Jin, Andy Ng, William Jogia, Corinne F. Maurice, and David Juncker
McGill University, CANADA

T2C-248.a AN ACOUSTIC-ELECTRICAL MICROFLUIDIC PLATFORM FOR mRNA-BASED CELL ENGINEERING
Yu-Hsi Chen, Mohammad Aghaamoo, Christopher C.W. Hughes, and Abraham P. Lee
University of California, Irvine, USA

T3B-350.a GENERATION OF TRANSMITOCHONDRIAL CYBRID USING A MICROFLUIDIC DEVICE
Ken-Ichi Wada[1,2], Kazuo Hosokawa[2], Yoshihiro Ito[2], Mizuo Maeda[2], Yui Harada[1], and Yoshikazu Yonemitsu[1]
[1]Kyushu University, JAPAN and [2]RIKEN, JAPAN

T3C-351.a ELECTRICAL CHARACTERIZATION OF 3D CELL SPHEROID
Kenichi Yoshikawa[1], Tatsuhito Sasaki[1], Takahiro Himuro[2], Katsuya Iuchi[3], Hisashi Hisatomi[1], and Yoji Saito[1]
[1]Seikei University, JAPAN, [2]Kure College, JAPAN, and [3]Saitama Cancer Center, JAPAN

T3A-352.a RESOLVING SPERM MOTILITY NEAR PILLARS USING µPIV
Melati S. Abdul Halim[1], Farzan Akbaridoust[1,2], and Reza Nosrati[1]
[1]Monash University, AUSTRALIA and [2]University of Melbourne, AUSTRALIA

T3B-353.a ATP-DRIVEN MUSCLE INTEGRATED MICROROBOT ACTUATED BY TRACTION OF ACTOMYOSIN-COLLAGEN HIBRID HYDROGEL
Kenjiro Kohno[1], Yuichi Hiratsuka[2], and Hiroaki Onoe[1]
[1]Keio University, JAPAN and [2]Japan Advanced Institute of Science and Technology (JAIST), JAPAN

W4B-459.a EVALUATION OF BACTERIAL ADHESION STRENGTH ON ANTIFOULING COPOLYMER FILMS BY USING MICROFLUIDIC SHEAR DEVICES
Yuta Kozuka[1], Zhou Lu[1], Tsukuru Masuda[1], Shintaro Hara[1], Toshihiro Kasama[1], Ryo Miyake[1], Norifumi Isu[2], and Madoka Takai[1]
[1]University of Tokyo, JAPAN and [2]LIXIL Corporation, JAPAN

W4C-460.a FISH-LIVER-ON-CHIP: A MICROFLUIDIC MODEL TO ASSESS BIOACCUMULATION OF ENVIRONMENTAL DRUG RESIDUES IN VITRO
Päivi Järvinen, Markus Haapala, Sari Tähkä, Hanna Lindstedt, and Tiina Sikanen
University of Helsinki, FINLAND

b - Diagnostics, Drug Testing and Personalized Medicine
Cancer Research, Capture and Analysis of Circulating Tumor Cells

M1B-153.b IN VITRO THREE-DIMENSIONAL MODEL OF CAPILLARY MICROCONSTRICTION FOR IMAGING CANCER CELL DYNAMICS
Yoshihiro Shiraga, Hidekuni Takao, Fusao Shimokawa, and Kyohei Terao
Kagawa University, JAPAN

M1C-154.b* AT-LINE, NON-INVASIVE MICROFLUIDIC ASSAY FOR FUNCTIONAL ASSESSMENT OF CAR T CELLS
Emily L. Jackson-Holmes, Guillaume Aubry, Miguel A. Ochoa, Nate J. Dwarshuis, Delta Ghoshal, Jimmy Ding, Melissa L. Kemp, Krishnendu Roy, and Hang Lu
Georgia Institute of Technology, USA

M1A-155.b* MICROFLUIDIC IN VITRO MODELS FOR STUDYING CIRCULATING TUMOR CELLS FATE IN THE MICROVASCULATURE
Emile Gasser[1], Kyohei Terao[2], Jean-Louis Viovy[1], Jean-Yves Pierga[3], and Catherine Villard[1]
[1]Université PSL, FRANCE, [2]Kagawa University, JAPAN, and [3]Université de Paris, FRANCE

M1B-156.b MICROFLUIDIC ISOLATION AND RELEASE OF TRIPLE-NEGATIVE BREAST CANCER CELLS IN BONE MARROW
Minh-Chau N. Le, Dongjiang Chen, Kierstin A. Smith, David D. Tran, and Z. Hugh Fan
University of Florida, USA

M1C-157.b EFFECTS OF CABOZANTINIB IN A RENAL TUMOR MICROENVIRONMENT ON-A-CHIP MODEL
Maria Virumbrales-Muñoz, Jose Ayuso, Jack Loken, Kathryn Denecke, E. Jason Abel, and David J. Beebe
University of Wisconsin, USA

T2A-249.b IMPEDANCE-BASED BIOPHYSICAL STRATIFICATION OF SECRETED APOPTOTIC BODIES IN CULTURE MEDIA FOR DRUG SENSITIVITY ASSESSMENT OF PANCREATIC TUMORS
Carlos Honrado, Sara Adair, John Moore, Armita Salahi, Todd Bauer, and Nathan Swami
University of Virginia, USA

T2B-250.b THE PRESENCE OF AN ECM CAPSULE AROUND LIVER TUMOR MODELS BLOCKS THE PENETRATION OF (NANO)-DRUGS
Agnieszka Zuchowska, Ruchi Bansal, and Séverine Le Gac
University of Twente, NETHERLANDS

T3C-354.b A RAPID, HIGH-VIABILITY AND HIGH-SPECIFICITY ELECTROPORATION-ENABLED ANTIBODY PROBING OF TUMOR CELLS IN WHOLE BLOOD
Tingting Hun, Xinyue Deng, and Wei Wang
Peking University, CHINA

T3A-355.b SPECIFICALLY LABELLING TUMOR CELLS FROM WHOLE BLOOD VIA MULTIPLE FILTRATION-LABELLING-RELEASE CYCLES
Tingting Hun[1], Qingmei Xu[1], Tingyu Li[1], Pan Zhang[1], Han Xu[1], Mingxin Xu[2], Qi Wang[2], and Wei Wang[1]
[1]Peking University, CHINA and [2]Dalian Medical University, CHINA

W4A-461.b MICROFLUIDIC PROBE FOR MULTIPLEX CAPTURE OF PROSTATE CIRCULATUNG TUMOR CELLS
Ayoub Glia[1,2], Muhammedin Deliorman[1], Pavithra Sukumar[1], Farhad K. Janahi[3], Bisan Samara[1], Ayoola T. Brimmo[1], and Mohammad A. Qaisaimeh[1,2]
[1]New York University, Abu Dhabi, UAE, [2]New York University, USA, and [3]Mohammed Bin Rashid University of Medicine and Health Sciences, UAE

b - Diagnostics, Drug Testing and Personalized Medicine
Clinical Chemistry

T3B-356.b A MICROFLUIDIC PLATFORM FOR UNDILUTED PLASMA SEPARATION AND ELECTROCHEMICAL DETECTION OF C-REACTIVE PROTEIN
Zhi-Xuan Lai and Nien-Tsu Huang
National Taiwan University, TAIWAN

T3C-357.b AUTOMATED MICROFLUIDIC DEVICE FOR WHOLE BLOOD PLASMA SEPARATION AND BIOMARKERS ANALYSIS IN MICROLITER SAMPLES
Alan M. Gonzalez-Suarez[1], Gulnaz Stybayeva[1,2], William A. Carey[1], and Alexander Revzin[1]
[1]Mayo Clinic, USA and [2]Sersense Inc., USA

b - Diagnostics, Drug Testing and Personalized Medicine
Drug Delivery

M1A-158.b* MICROFLUIDIC CELL SHEARING ENABLES HIGHLY EFFECTIVE MACROMOLECULE INTRACELLULAR DELIVERY
Chan Kwon, GeoumYoung Kang, and Aram Chung
Korea University, KOREA

T2C-251.b LYMPHOCYTE INSPIRED INTELLIGENT HYDROGEL SYSTEM
Sophie Wan Mei Lian[1], Guo Song[1], Kewei Ren[1], John S. Ho[1,2], and Chia-Hung Chen[3]
[1]National University of Singapore, SINGAPORE, [2]Institute for Health Innovation and Technology (iHealthtech), SINGAPORE, and [3]City University of Hong Kong, CHINA

T2A-252.b ENHANCED DRUG LOADING INTO EXTREACELLULAR VESICLES VIA RAPID TONICITY CHANGE USING EXODISC
Chaeeun Lee[1,2], Sumit Kumar[2], Juhee Park[2], and Yoon-Kyoung Cho[1,2]
[1]Ulsan National Institute of Science and Technology (UNIST), KOREA and
[2]Center for Soft and Living Matter, Institute for Basic Science (IBS), KOREA

T3A-358.b ULTRASOUND-TRIGGERED ON-DEMAND ADENO-ASSOCIATED-VIRUS RELEASE FROM HYDROGEL MICROBEADS FOR GENE THERAPY
Shuhei Takatsuka[1], Takeshi Kubota[1], Yuta Kurashina[2], and Hiroaki Onoe[1]
[1]Keio University, JAPAN and [2]Tokyo Institute of Technology, JAPAN

W4B-462.b STUDY OF ELECTROCHEMOTHERAPY EFFECT IN CELL SPHEROIDS USING A MICROFLUIDIC DEVICE BASED ON GLASS TECHNOLOGY
Pauline Bregigeon, Julien Marchalot, Laure Franqueville, Christian Vollaire, Marie Frénéa-Robin, and Charlotte Rivière
Université de Lyon, FRANCE

W4C-463.b DEVELOPMENT OF A MICRO-ELECTROPORATION SYSTEM FOR HIGH THROUGHPUT PRODUCTION OF ANTICANCER DRUG-LOADED EXOSOMAL NANOMEDICINES
Kazuya Fujita, Niko Kimura, Toyohiro Naito, and Noritada Kaji
Kyushu University, JAPAN

b - Diagnostics, Drug Testing and Personalized Medicine
Drug Screening and Development

M1B-159.b DROPLET PLATFORM FOR SCREENING COMBINATORIAL ANTIBIOTIC THERAPIES
Hui Li, Pengfei Zhang, Fangchi Shao, Jiumei Hu, Aniruddha Kaushik, Kuangwen Hsieh, and Jeff Tza-Huei Wang
Johns Hopkins University, USA

M1C-160.b SINGLE-NANOPARTICLE CHARACTERIZATION OF MRNA PAYLOAD IN LIPID NANOPARTICLES
Sixuan Li, Yizong Hu, Kuangwen Hsieh, Andrew Li, Hai-Quan Mao, Tza-Huei (Jeff) Wang
Johns Hopkins University, USA

M1A-161.b* CELL SPHEROID MODELS IN 3D-PRINTED AGAROSE MICROWELLS FOR DRUG RESPONSE STUDIES
Qiyue Luan, Jeffrey Becker, Celine Macaraniag, Jian Zhou, Takeshi Shimamura, and Ian Papautsky
University of Illinois, Chicago, USA

W4A-464.b COMBINED ON-CHIP SPECTROSCOPY AND RHEOLOGY AS A PRE-CLINICAL DRUG SCREENING TOOL FOR SICKLE CELL DISEASE
Scott Hansen[1], John Higgins[2,3], and David Wood[1]
[1]University of Minnesota, USA, [2]Massachusetts General Hospital, USA, and [3]Harvard Medical School, USA

W4B-465.b MICROCRATER-ARRAYED CELL CHIPS FOR FACILITATING IN-VIVO ANTI-CANCER DRUG TREATMENTS
Ching-Te Kuo[1], Yu-Sheng Lai[2], Siang-Rong Lu[2,3], Hsinyu Lee[2], and Hsiu-Hao Chang[3]
[1]National Sun Yat-sen University, TAIWAN, [2]National Taiwan University, TAIWAN, and
[3]National Taiwan University Hospital and National Taiwan University College of Medicine, TAIWAN

W4C-466.b ***EX VIVO*** **TUMORS ON CHIP - A COMPARATIVE STUDY OF MICRODISSECTED TISSUE AND TISSUE SLICES**
Dina Dorrigiv[1,2], Kayla Simeone[1], Benjamin Péant[1], Euridice Carmona[1], Jennifer K. Dupont[1], Anne-Marie Mes-Masson[1], and Thomas Gervais[1,2]
[1]Université de Montréal, CANADA and [2]Polytechnique Montréal, CANADA

b - Diagnostics, Drug Testing and Personalized Medicine
Liquid Biopsy and Sample Preparation

M1B-162.b **A BLOOD PLASMA SEPARATION PLATFORM USING DIAMAGNETIC REPULSION OF BLOOD CELLS**
Jieung Oh, Seyong Kwon, MinSeok Lee, Eujin Um, Joonwoo Jeong, and Joo H. Kang
Ulsan National Institute of Science and Technology (UNIST), KOREA

T2B-253.b **ALL-IN-ONE SAMPLER FOR ONE-STEP DRIED BLOOD SPOT SAMPLE COLLECTION**
Mikolaj Dobielewski, Göran Stemme, and Niclas Roxhed
KTH Royal Institute of Technology, SWEDEN

T2C-254.b **PORTABLE PLATFORM FOR LEUKOCYTE EXTRACTION FROM BLOOD USING SHEATH-FREE DETERMINISTIC LATERAL DISPLACEMENT**
Oriana G. Chavez-Pineda, Roberto Rodriguez-Moncayo, Alan M. Gonzalez-Suarez, Pablo E. Guevara-Pantoja, and Jose L. Garcia-Cordero
Cinvestav, MEXICO

T3B-359.b **MICROFLUIDIC RARE ALLELE ENRICHEMENT IN CIRCULATING DNA SAMPLE**
Adelaide Lety-Stefanska[1], Alvaro Conde[1,2], Ieva Keraite[1,3], Nicholas R. Leslie[1], and Maïwenn Kersaudy-Kerhoas[1]
[1]Heriot-Watt University, UK, [2]Micronit B.V, NETHERLANDS, and [3]CNAG-CRG, SPAIN

T3C-360.b **CHARACTERIZATION OF THERMALLY RESPONSIVE ALKANE PARTITIONS FOR APPLICATIONS IN POINT-OF-CARE DIAGNOSTICS**
David J. Boegner, Micaela L. Everitt, and Ian M. White
University of Maryland, USA

W4A-467.b **ISOLATION OF EXTRACELLULAR VESICLES SUBPOPULATIONS BY COMBINATION OF CAPTURE BY APTAMER-COATED BEAD MICROCARRIERS WITH MICROFLUIDIC SIZE-SORTING**
Marie Gaillard, François Boizot, Camille Raillon, Vincent Agache, Aurélie Thuaire, and Yoann Roupioz
University Grenoble Alpes, FRANCE

W4B-468.b* **AUTOMATIC DETECTION OF MULTIPLE SYNOVIAL FLUID BIOMARKERS FOR PERIPROSTHETIC JOINT INFECTION ON AN INTEGRATED MICROFLUIDIC SYSTEM**
To-Wen Chen[1], Priya Gopinathan[1], Feng-Chih Kuo[2], Huey-Ling You[2], Hwan-You Chang[1], Mel S. Lee[2], and Gwo-Bin Lee[1]
[1]National Tsing Hua University, TAIWAN and [2]Chang Gung University, TAIWAN

W4C-469.b **PAPER-BASED PURIFICATION AND CONCENTRATION OF *M. TUBERCULOSIS* GENOMIC DNA USING ISOTACHOPHORESIS**
Shruti Soni and Bhushan J. Toley
Indian Institute of Science, Bangalore, INDIA

W4A-470.b FROM DROP TO SPOTS: AUTONOMOUS DRIED BLOOD SPOT SAMPLING DEVICE ENABLING DECENTRALIZED MONITORING OF BIOLOGICALS
Lorenz Van Hileghem, Dries Vloemans, Wannes Verbist, Debby Thomas, Francesco Dal Dosso, and Jeroen Lammertyn
Katholieke Universiteit Leuven, BELGIUM

W4B-471.b ONE-STOP MICROFLUIDIC PLATFORM FOR DNA EXTRACTION AND LIBRARY PREPARATION FOR NEXT-GENERATION SEQUENCING ANALYSIS
Eduardo Cervantes, Julia Yoo, Adam Barner, Eugenia Carvajal, Cheng-Chang Lee, Severine Margeridon, Foteini Christodoulou, and Mais Jebrail
Miroculus, USA

W4C-472.b A PORTABLE INTEGRATED WORKFLOW TO IDENTIFY SEPSIS CAUSING PATHOGENS USING CELL-FREE CIRCULATING MICROBIAL DNA
Ana Martinez-Lopez[1], Linda Marriott[1], Antonio Liga[1], Amanda Warr[2], Nicholas R. Leslie[1], and Maïwenn Kersaudy-Kerhoas[1]
[1]Heriot-Watt University, UK and [2]University of Edinburgh, UK

W4A-473.b* HIGH-THROUGHPUT NANOFLUIDIC EXTRACELLULAR VESICLE ISOLATION VIA NANOPOROUS HIERARCHICAL MATERIALS
Andrew Lin, Zhimin Jiang, James Pikul, and David Issadore
University of Pennsylvania, USA

W4B-474.b QUANTITATIVE AND MULTIPLEX DETECTION OF EXTRACELLULAR VESICLE-DERIVED MICRORNA BIOMARKERS VIA ROLLING CIRCLE AMPLIFICATION WITHIN ENCODED HYDROGEL MICROPARTICLES
Dana Al Sulaiman, Nidhi Juthani, and Patrick S. Doyle
Massachusetts Institute of Technology, USA

W4C-475.b LAB-IN-A-FIBER OPTOFLUIDIC DEVICE FOR SEPARATION AND DETECTION OF MICRON SIZED PARTICLES
Tharagan Kumar[1], Achar V. Harish[1,2], Sebsatian Etcheverry[1,2], Walter Margulis[1,2], Fredrik Laurell[1], and Aman Russom[1,3]
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b - Diagnostics, Drug Testing and Personalized Medicine
Neurobiology/Neuroscience

M1C-163.b* DIRECTIONAL CONTROL OF NEURITE OUTGROWTH BY MICRO-PATHWAYS ON A COLLAGEN GEL SHEET
Mikihisa Yamamoto[1], Dina Myasnikova[1], Minghao Nie[1], Yuya Morimoto[1], Midori Negishi[2], and Shoji Takeuchi[1]
[1]University of Tokyo, JAPAN and [2]Musashino University, JAPAN

T2A-255.b SUSTAINED LOCAL STIMULATION OF BRAIN SLICES ON-CHIP
Michael T. Cryan, Yuxin Li, and Ashley E. Ross
University of Cincinnati, USA

T3A-361.b UNRAVELING SELECTIVE SIGNALS OF NEURODEGENERATION WITH NEUROFLUIDIC DEVICES
Zeynep Malkoc and Anja Kunze
Montana State University (MSU), USA

W4A-476.b MICROELECTRODE ARRAY WITH BACK-TO-BACK LAYERED CO-CULTURE OF NEURONS AND ASTROCYTES
Satoshi Yoshida and Takashi Yasuda
Kyushu Institute of Technology, JAPAN

W4B-477.b* NEURAL PROBE TO SAMPLE BRAIN FLUID DROPLETS ON DEMAND WITH HIGH RECOVERY FRACTION
Joan Teixidor, Arnaud Bertsch, and Philippe Renaud
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

b - Diagnostics, Drug Testing and Personalized Medicine

Nucleic-Acid Analysis

M1A-164.b* ULTRA-RAPID REAL-TIME MICROFLUIDIC POLYMERASE CHAIN REACTION INSTRUMENT FOR CLINICAL AND FORENSIC APPLICATIONS
Renna L. Nouwairi[1], Larissa L. Cunha[1], Rachelle A. Turiello[1], Orion Scott[2], Jeff Hickey[2], Stuart Knowles[3], Jeff D. Chapman[2], and James P. Landers[1,2]
[1]University of Virginia, USA, [2]MicroGEM International, USA, and [3]Invetech, AUSTRALIA

M1B-165.b* MINI: AN ENERGY-FLEXIBLE POINT-OF-CARE DEVICE FOR HIGH-THROUGHPUT SCREENING
Juan M. Boza[1], Duncan McCloskey[1], Daniel Butler[2], Christipher Mozsary[2], Christopher Mason[2], and David Erickson[1]
[1]Cornell University, USA and [2]Weill Cornell, USA

M1C-166.b* A MICROPATTERNED GLASS SUBSTRATE FOR RAPID SEQUENCE DETECTION ON LONG DNA MOLECULES USING CRISPR-CAS9
Dharma Varapula, Kaitlin Raseley, and Ming Xiao
Drexel University, USA

T2B-256.b ROLLING CIRCLE AMPLIFICATION-COUPLED NANOPORE FOR QUANTIFICATION OF miRNAS
Ming Dong, Zifan Tang, Steven Hicks, and Weihua Guan
Pennsylvania State University, USA

T2C-257.b INFLUENCE OF TOPOGRAPHY ON THE SPONTANEOUS FLOW OF DNA MOLECULES IN NANOFLUIDIC CHANNELS
Tim Erichlandwehr[1,2], Franziska M. Esmek[1], Dennis Mors[1], and Irene Fernandez-Cuesta[1]
[1]Universität Hamburg, GERMANY and [2]Deutsches Elektronen-Synchroton (DESY), GERMANY

T2A-258.b A NOVEL MICROBEAD-BASED DIGITAL PCR TO IMPROVE DETECTION SENSITIVITY
Benediktus N. Hapsianto[1], Naoshi Kojima[2], Nicolas Lobato-Dauzier[1], Ryoji Kurita[2], Anthony Genot[1], Yukiko T. Matsunaga[1], Teruo Fujii[1], and Soo Hyeon Kim[1]
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[2]National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

T2B-259.b DNA OPTICAL MAPPING IN REAL TIME ON PASSIVE 3D NANOFLUIDIC DEVICES
Franziska M. Esmek[1], Dennis Mors[1], Tim Erichlandwehr[1], Anton Kettner[1], Nicole Fischer[2], Thomas Günther[3], Adam Grundhoff[3], and Irene Fernandez-Cuesta[1]
[1]Universität Hamburg, GERMANY, [2]Institute for Medical Microbiology, Virology and Hygiene, GERMANY, and [3]Heinrich-Pette-Institut, GERMANY

T3B-362.b ***LMP1* GENE DETECTION THROUGH POLYMERASE CHAIN REACTION IN MICROFLUIDIC CHIP COMBINED WITH NANOSLIT SURFACE PLASMON RESONANCE SENSOR**
Han-Yun Hsieh[1], Ray Chang[2], Yung-Yu Huang[1], Pei-Kuen Wei[3], Yu-Jui Fan[2], and Horn-Jiunn Sheen[1]
[1]National Taiwan University, TAIWAN, [2]Taipei Medical University, TAIWAN, and [3]Academia Sinica, TAIWAN

T3C-363.b **FEMTOMOLAR MICRORNA DETECTION BY DIAGNOSTIC DNA SYSTEM AND BIOLOGICAL NANOPORE**
Nanami Takeuchi[1,2] and Ryuji Kawano[1]
[1]Tokyo University of Agriculture and Technology, JAPAN and [2]JSPS Fellowship, JAPAN

T3A-364.b **POINT-OF-CARE DIAGNOSIS OF KAPOSI'S SARCOMA IN SUB-SAHARAN AFRICA**
Duncan McCloskey[1], Caitlyn Genovese[1], Aggrey Semeere[2], Jeffrey Martin[3], Ethel Cesarman[1], and David Erickson[1]
[1]Cornell University, USA, [2]Makerere University, UGANDA, and [3]University of California, San Francisco, USA

T3B-365.b **HYBRID OPTO-THERMOCYCLER FOR RT-qPCR USING A BUBBLE-FREE MICROFLUIDIC DEVICE DETECTS SARS-CoV-2**
Pablo E. Guevara-Pantoja, Roberto Rodriguez-Moncayo, Oriana G. Chavez-Pineda, Keziah B. Reynoso-Hernandez, Diana F. Cedillo-Alcantar, Jose A. Ramirez-Pool, Leandro A. Nuñez-Muñoz, Beatriz Xoconostle-Cazares, and Jose L. Garcia-Cordero
Cinvestav, MEXICO

T3C-366.b **CHEMICALLY MODULATED EXTENSION ENABLES RAPID MICROSCALE ISOTHERMAL PCR WITH HIGH REPEATABILITY OF AMPLIFICATION**
MinGin Kim and Victor M. Ugaz
Texas A&M University, USA

T3A-367.b **DNA COMPUTING DROPLET TO DETECT miRNAS FOR CANCER DIAGNOSIS**
Jing Gong[1], Nozomi Tsumura[1], Yusuke Sato[2], and Masahiro Takinoue[1]
[1]Tokyo Institute of Technology, JAPAN and [2]Tohoku University, JAPAN

T3B-368.b **AMPLIFICATION OF NUCLEIC ACIDS IN MICROWELL USING PHOTOTHERMAL EFFECT**
Ye Lin Kim and Joong Ho Shin
Pukyong National University, KOREA

W4C-478.b* **MAGNETOFLUIDICS-ENABLED POINT-OF-CARE SARS-COV-2 DIAGNOSTICS**
Alexander Y. Trick, Fan-En Chen, Liben Chen, Pei-Wei Lee, Alexander C. Hasnain, Heba H. Mostafa, Karen C. Carroll, and Tza-Huei Wang
Johns Hopkins University, USA

W4A-479.b* **TOWARDS A MULTIPLEXED BARCODE CRISPR/Cas12a-ASSISTED PLATFORM FOR THE IDENTIFICATION AND QUANTIFICATION OF SINGLE CpG METHYLATION SITES**
Jeanne E. van Dongen, Johanna T.W. Berendsen, Jan C.T. Eijkel, and Loes I. Segerink
University of Twente, NETHERLANDS

W4B-480.b **REAL TIME QUANTITATIVE IN-SITU DNA HYBRIDIZATION VIA MICROCANTILEVER ARRAYS IN LIQUID**
Annalisa De Pastina, Giulio Brunetti, and Martin Hegner
Trinity College Dublin, IRELAND

W4C-481.b* **RAPID ANALYSIS OF EXOSOMAL MICRORNAS USING AN IOT SENSOR**
Jingjing Qian, Qinming Zhang, Mingdian Liu, Yixuan Wang, and Meng Lu
Iowa State University, USA

W4A-482.b BISULFITE BASED ANALYSIS OF DNA METHYLATION MARKERS IN A MICROFLUIDIC ENVIRONMENT WITH INTEGRATED SILICA MATRIX PURIFICATION AND qPCR READOUT

Janik Kärcher[1,2], Denise Brünig[1], Britta Schulze[1], Yvonne Beyl[1], Anke Detzer[1], Christian Grumaz[1], Eva Weimer[1], Franz Lärmer[1], Sascha Tierling[2], and Jörn Walter[2]
[1]Robert Bosch GmbH, GERMANY and [2]University of Saarland, GERMANY

W4B-483.b* AN INTEGRATED MICROFLUIDIC SYSTEM FOR AUTOMATIC SCREENING DNA APTAMERS FOR HUMAN NEUTROPHIL PEPTIDE 1-3

Hung-Bin Wu[1], Rishabh Gandotra[1], Priya Gopinathan[1], Yi-Da Chung[1], Huey-Ling You[2], Feng-Chih Kuo[2], Mel S. Lee[2], and Gwo-Bin Lee[1]
[1]National Tsing Hua University, TAIWAN and [2]Kaohsiung Chang Gung Memorial Hospital, TAIWAN

W4C-484.b ON-CHIP CAPTURE, ISOLATION AND DETECTION OF GENOMIC *Neisseria gonorrhoeae* DNA

Pablo Rodriguez-Mateos[1], Bongkot Ngamsom[1], Cheryl Walter[1], Charlotte E. Dyer[1], Ernest Wandera[2], Jesse Gitaka[2], Alexander Iles[1], and Nicole Pamme[1]
[1]University of Hull, UK and [2]Mount Kenya University, KENYA

W4A-485.b A MODELLING TOOL TO ESTIMATE THE CATALYTIC ACTIVITY OF DNAZYMES AND AID THEIR DESIGN FOR BIOSENSING APPLICATIONS

Aida Montserrat Pagès, Pallieter de Hornois, Maarten Hertog, Dragana Spasic, and Jeroen Lammertyn
Katholieke Universiteit Leuven, BELGIUM

W4B-486.b MODEL-BASED CLASSIFICATION OF RAIN IN DIGITAL PCR AS A BENCHMARK FOR ASSAY RELIABILITY

Pieter Berden[1,2,3], Willem Van Roy[1], 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]Katholieke Universiteit Leuven, BELGIUM, and [3]Vlaams Instituut voor Biotechnologie (VIB), BELGIUM

W4C-487.b SINGLE-STEP QUANTIFICATION OF SPECIFIC NUCLEIC ACID SEQUENCES IN MICROFLUIDICS USING A MULTILABELED HYBRID DNA DUPLEX

Inês F. Pinto[1], Ruben R.G. Soares[1], and Aman Russom[1,2]
[1]KTH Royal Institute of Technology, SWEDEN and [2]AIMES - Center for the Advancement of Integrated Medical and Engineering Sciences at Karolinska Institutet and KTH Royal Institute of Technology, SWEDEN

W4A-488.b* TOWARDS QUANTITATIVE NUCLEIC ACID ISOTHERMAL AMPLIFICATION AT THE POINT-OF-CARE USING NUCLEATION SITE COUNTING IN PAPER MEMBRANES

Benjamin P. Sullivan, Andrew T. Bender, Yu-Shan Chou, Coleman D. Martin, Minyung Song, Jonathan D. Posner
University of Washington, Seattle, USA

W4B-489.b A SMARTPHONE-BASED REAL-TIME HIV DETECTION WITH AN INTERNAL AMPLIFICATION CONTROL (IAC)

Emeka Nwanochie[1], Melinda A. Lake[1], Navaporn Sritong[1], Aiswarya A. Ramanujam[1], Eddy Odari[2], Dong Hoon Lee[1], Ashlee J. Colbert[1], Steven T. Wereley[1], Tamara L. Kinzer-Ursem[1], and Jacqueline C. Linnes[1]
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b - Diagnostics, Drug Testing and Personalized Medicine
Pathogen Detection and Antibiotics

M1A-167.b* **A MICROFLUIDIC ANTIBIOTIC CONCENTRATION GRADIENT GENERATOR INTEGRATING SURFACE-ENHANCED RAMAN SPECTROSCOPY FOR MULTIPARALLEL ANTIMICROBIAL SUSCEPTIBILITY TESTING**
Shang-Jyun Lin, Po-Hsuan Chao, and Nien-Tsu Huang
National Taiwan University, TAIWAN

M1B-168.b* **DEVELOPMENT OF AN AUTOMATED, POINT-OF-CARE DIAGNOSTIC ASSAY FOR RAPID DETECTION OF *BORDETELLA* SPP.**
Killian C. O'Connell[1], Alvand K. Moini[1], Erik L. Hewlett[1], Jeff D. Chapman[2], and James P. Landers[1,2]
[1]University of Virginia, USA and [2]MicroGEM International PLC, USA

M1C-169.b **ELECTRICAL DISCRIMINATIONS OF DRUG-RESISTANT BACTERIA VIA ANTIBIOTIC STIMULATION-ASSISTED MICROPORE SENSING**
Taisuke Shimada[1], Aomi Yoshikawa[1], Takao Yasui[1,2], Seiji Yamsaki[3], Kazuki Nagashima[2,4], Kunihiko Nishino[3], Takeshi Yanagida[4,5], and Yoshinobu Baba[1,4]
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M1A-170.b **A PROBE-BASED MELT CURVE ANALYSIS ENABLED ID-AST OF BACTERIAL STI IN A POINT-OF-CARE DEVICE**
Fan-En Chen, Anju Nambiar, Justin Hardick, Johan Melendez, Alexander Y. Trick, and Tza-Huei Wang
Johns Hopkins Univeristy, USA

M1B-171.b **MAGNETOFLUIDIC-ENABLED POINT-OF-CARE DETECTION OF MULTI-DRUG RESISTANT CANDIDA AURIS IN < 30 MINUTES**
Pei-Wei Lee, Marissa Totten, Kushagra Shah, Fan-En Chen, Liben Chen, Alexander Y. Trick, Sean X. Zhang, Kuangwen Hsieh, and Tza-Huei Wang
Johns Hopkins University, USA

M1C-172.b **SMARTPHONE MULTIPLEX MICROCAPILLARY DIAGNOSTICS USING CYGNUS: AN EVALUATION OF RAPID SEROTYPE-SPECIFIC DENGUE NS1 DETECTION USING 255 PATIENT SAMPLES**
Sarah Needs[1], Sirintra Sirivisoot[2], Sophie Jegouic[1], Tanapan Prommool[3], Nuno Reis[4,5], Prasit Luangaram[3], Chatchawan Srisawat[6], Prida Malasit[2,6], Panisadee Avirutnan[2,6], Chunya Puttikhunt[2,6], and Alexander Edwards[1,5]
[1]University of Reading, UK, [2]Faculty of Medicine Siriraj Hospital, THAILAND, [3]National Center for Genetic Engineering and Biotechnology, THAILAND, [4]University of Bath, THAILAND, [5]Capillary Film Technology Ltd, UK, and [6]Mahidol University, THAILAND

M1A-173.b **MINIATURISATION OF THE GOLD STANDARD BROTH MICRODILUTION METHOD TO MAKE A MULTIPLEX, HIGH THROUGHPUT ANTIBIOTIC SUSCEPTIBILITY TEST FOR DETERMINATION OF SUSCEPTIBILITY IN UROPATHGOENIC E. COLI IN URINARY TRACT INFECTIONS**
Sarah H. Needs, Sultan Ilayda Dönmez, and Alexander D. Edwards
University of Reading, UK

M1B-174.b **LolliTest: AT-HOME SALIVA SAMPLING FOR DIAGNOSIS OF RESPIRATORY DISEASES**
Ulri N. Lee[1], Xiaojing Su[1], Damielle L. Hieber[1], Anika M. McManamen[1], Wan-chen Tu[1], Tung Ching Chan[1], Grant W. Hassan[1], Meg G. Takezawa[1], Erwin Berthier[1], Sanitta Thongpang[1,2], and Ashleigh B. Theberge[1,3]
[1]University of Washington, Seattle, USA, [2]Mahidol University, THAILAND, and [3]University of Washington School of Medicine, USA

T2C-260.b DETECTION OF PATHOGENIC *E. COLI* USING MAGNETIC SEPARATION AND CELL-FREE PAPER SENSORS

Helena de Puig Guixe[1], Michael S. Wiederoder[2], Devora Najjar[1], Shannon K. McGraw[2], and James J. Collins[1]
[1]Harvard University, USA and [2]US Army Combat Capabilities Development Command – Soldier Center, USA

T2A-261.b AGAR-FREE, FAST AND CHEAP BACTERIOPHAGE COUNTING ASSAY USING MICROFLUIDIC DEVICE IN DARKFIELD IMAGING SYSTEM

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

T2B-262.b AN IMPEDANCE BASED FAST ANTIMICROBIAL SUSCEPTIBILITY TEST FOR PHENOTYPIC PROFILING

Roeland H.G. Mingels[1], Bethany Martin[1,2], Lucy Bock[2], Daniel C. Spencer[1], Mark Sutton[2], Robert C. Read[1], and Hywel Morgan[1]
[1]University of Southampton, UK and [2]Public Health England, UK

T2C-263.b SENSITIVE DIAGNOSIS OF BACTERIAL INFECTIONS WITH LABEL-FREE MICROFLUIDICS

Junchen Liao[1], Song Lin Chua[2], and Bee Luan Khoo[1]
[1]City University of Hong Kong, HONG KONG and [2]Hong Kong Polytechnic University, HONG KONG

T3C-369.b A NANOMATERIAL-INTEGRATED PAPER-BASED ANALYTICAL DEVICE FOR PATHOGEN DETECTION

Hao Yuan, Jia-Hui Lin, Zhi-Shun Dong, Wei-Ting Chen, and Chien-Fu Chen
National Taiwan University, TAIWAN

T3A-370.b A MICROFLUIDIC DEVICE USING CENTURIFUGAL FORCE TO CONCENTRATE BACTERIAL SAMPLE AND TO PERFORM RAPID ANTIMICROBIAL SUSCEPTIBILITY TEST

Sunjae Hwang and Jungil Choi
Kookmin University, KOREA

W4C-490.b RAPID DETECTION OF VIABLE BACTERIA IN WHOLE BLOOD FOR EARLY SEPSIS DIAGNOSIS AND SUSCEPTIBILITY TESTING

Sharath Narayana Iyengar[1], Jiri Dietvorst[2], Amparo Ferrer-Vilanova[2], Gonzalo Guirado[2], Xavier Muñoz-Berbel[2], and Aman Russom[1]
[1]KTH Royal Institute of Technology, SWEDEN and [2]Universitat Autónoma de Barcelona, SPAIN

W4A-491.b TOWARDS A PHONE-BASED POC ASSAY FOR DIAGNOSIS AND SURVEILLANCE OF CONGENITAL CHAGAS DISEASE

Federico Schaumburg, Luz M. Peverengo, Juan P. Vidocevich, Iván Marcipar, and Claudio L.A. Berli
Universidad Nacional del Litoral, ARGENTINA

W4B-492.b A LOW-VOLUME SAMPLE AND HIGH SENSITIVE MICROFLUIDIC PAPER-BASED ANALYTICAL DEVICE INTREGRATED SUCROSE VALVE FOR AUTOMATED COMPETITIVE ELISA OF AFLATOXIN B_1

Sumamal Charernchai[1], Miyuki Chikae[1], Wanida Wonsawat[2], Daisuke Hirose[1], and Yuzuru Takamura[1]
[1]Japan Advanced Institute of Science and Technology (JAIST), JAPAN and
[2]Suan Sunandha Rajabhat University, THAILAND

W4C-493.b SIMULTANEOUS DETECTION OF PROTEIN AND NUCLEIC ACID BIOMARKERS VIA PAPER-BASED MULTIALANALYTE SENSOR

Anna Brunauer[1], Anna-Sophia Kittel[1], René D. Verboket[2], Felix von Stetten[1,3], and Susanna M. Früh[1,3]
[1]University of Freiburg, GERMANY, [2]University Hospital Frankfurt, GERMANY, and
[3]Hahn-Schickard, GERMANY

W4A-494.b HIGHLY AUTOMATED ON CHIP MAGNETIC BEAD-BASED IMMUNOASSAYS FOR THE IDENTIFICATION AND QUANTIFICATION OF CARBAPENAMASE-PRODUCING ENTEROBACTERIACEAE

Anne-Carey Lucas[1], Fanny Rousseau[2], Myriam Cubizolles[1], Manuel Alessio[1], François Boizot[1], Hervé Boutal[2], Fabrice Navarro[1], Stéphanie Simon[2], Yves Fouillet[1], Charlotte Parent[1], and Karla Perez-Toralla[2]
[1]University Grenoble Alpes, FRANCE and [2]Paris-Saclay University, FRANCE

W4B-495.b CRISPR/CAS9 BASED DNA-COMBING ASSAY FOR DETECTING ANTI-MICROBIAL RESISTANCE GENES ON PLASMIDS

Gaurav Goyal[1], Elina Ekedahl[1], My Nyblom[1], Jens Krog[2], Erik Torstensson[2], Tsegaye Sewunet[3], Christian Giske[3], Visanu Thamlikitkul[4], Tobias Ambjörnsson[2], and Fredrik Westerlund[1]
[1]Chalmers University of Technology, SWEDEN, [2]Lund University, SWEDEN, [3]Karolinska Institute, SWEDEN, and [4]Mahidol University, THAILAND

W4C-496.b ADVANTAGEOUS IMMUNOSENSING PLATFORM TARGETING ANALYTES RELATED TO INFECTIOUS DISEASES

Mariana D. Avila-Huerta[1], Cynthia Rodríguez-Nava[2], Edwin J. Ortiz-Riaño[1], Diana L. Mancera-Zapata[1], Karen Cortés-Sarabia[2], and Eden Morales-Narváez[1]
[1]Centro de Investigaciones en Óptica, MEXICO and [2]Universidad Autónoma de Guerrero, MEXICO

W4A-497.b A DIGITAL DIPSTICK FOR MULTIPLEXED BACTERIA DETECTION

Emre Iseri, Angelos Valandis Miliadis, and Wouter van der Wijngaart
KTH Royal Institute of Technology, SWEDEN

b - Diagnostics, Drug Testing and Personalized Medicine
Personalized Medicine

M1C-175.b ON-CHIP ASSAY FOR HOME-SAMPLING, MAIL-BASED SHIPPING AND CENTRALIZED LABORATORY READOUT

Janosch Hauser, Matilda Dale, Jochen M. Schwenk, Göran Stemme, Claudia Fredolini, and Niclas Roxhed
KTH Royal Institute of Technology, SWEDEN

M1A-176.b* DETECTING CARDIOVASCULAR BIOMARKERS BY USING AN INTEGRATED RFID BIOSENSING SYSTEM

Yu-Jen Cheng[1], Ren-Wei Cheng[2], Ruo-Hsuan Gao[3], Tsung-Heng Tsai[2], Chien-Nan Kuo[3], and Gwo-Bin Lee[1]
[1]National Tsing Hua University, TAIWAN, [2]National Chung Cheng University, TAIWAN, and [3]National Yang Ming Chiao Tung University, TAIWAN

M1B-177.b LAB AT HOME: MICROFLUIDIC DROPLET ROBOT FOR A SINGLE DROP OF BLOOD MULTI-TARGET BIOCHEMICAL ANALYSIS

Zhi-Qiang Zuo, Jian-Zhang Pan, and Qun Fang
Zhejiang University, CHINA

M1C-178.b* A SAMPLE-TO-ANSWER ELECTROCHEMICAL BIOSENSOR SYSTEM FOR BIOMARKER DETECTION

Kruthika Kikkeri, Dan Wu, and Joel Voldman
Massachusetts Institute of Technology, USA

T2A-264.b ACCELERATED AND HIGHLY EFFICIENT T CELL ACTIVATION VIA ACOUSTIC MICROSTREAMING

Ruoyu Jiang, Abhinand M. Sudarshana, and Abraham P. Lee
University of California, Irvine, USA

T3B-371.b ISOLATION, LABELING, AND CHARACTERIZATION OF CELLS IN A MICROFLUIDIC MICROWELL DEVICE FOR CELL THERAPY MANUFACTURING
Kevin Loutherback and Allan B. Dietz
Mayo Clinic, USA

W4B-498.b MAGNETICALLY ACTUATED GLAUCOMA DRAINAGE DEVICE WITH ADJUSTABLE FLOW PROPERTIES AFTER IMPLANTATION
Inês C.F. Pereira[1], Hans M. Wyss[1], Henny J.M. Beckers[2], and Jaap M.J. den Toonder[1]
[1]Eindhoven University of Technology, NETHERLANDS and
[2]Maastricht University Medical Centre+ (MUMC+), NETHERLANDS

b - Diagnostics, Drug Testing and Personalized Medicine
Protein Analysis and Proteomics

M1A-179.b* PREVENTION OF EVAPORATION IN FEMTOLITER-SCALE WATER-IN-AIR DROPLET GENERATION FOR DIGITAL COUNTING OF BIOMOLECULES
Bo Hoon Han[1,2], Juhwan Park[1], Seok Chung[2], and Ji Yoon Kang[1]
[1]Korea Institute of Science and Technology (KIST), KOREA and [2]Korea University, KOREA

M1B-180.b WIRELESS POWER-UP AND READOUT OF LABEL-FREE ELECTRONIC DETECTION OF PROTEIN BIOMARKERS
Hassan Raji, Pengfei Xie, Seyed Reza Mahmoodi, and Mehdi Javanmard
Rutgers University, USA

T3C-372.b SURFACE-BASED BIOSENSOR: 100% CAPTURE ON THIN-LAYERED ELISA
Adelina Smirnova[1], Ryoichi Ohta[1], Emi Mori[1], and Takehiko Kitamori[1,2]
[1]University of Tokyo, JAPAN and [2]National Tsing Hua University, TAIWAN

W4C-499.b DETECTION OF SYSTEMIC AND ORAL INFLAMMATION BIOMARKERS THROUGH BIOCHEMICAL AND MICROFLUIDIC INTEGRATION
Benita Johannsen[1], Desirée Baumgartner[2], Lena Karkossa[1], Lara Müller[1], Nils Paust[1,2], Michal Karpíšek[3], Nagihan Bostanci[4], Roland Zengerle[1,2], and Konstantinos Mitsakakis[1,2]
[1]Hahn-Schickard, GERMANY, [2]University Freiburg, GERMANY,
[3]BioVendor Laboratorní Medicína a.s., CZECH REPUBLIC, and [4]Karolinska Institutet, SWEDEN

W4A-500.b AUTOMATION OF PEPTIDE DESALTING BY CENTRIFUGAL MICROFLUIDICS
Jan-Niklas Klatt[1,2], Thien-Ly Julia Dinh[1], Nils Paust[1,2], Roland Zengerle[1,2], Frank Schmidt[3], Oliver Schilling[1], and Tobias Hutzenlaub[1,2]
[1]University of Freiburg, GERMANY, [2]Hahn-Schickard, GERMANY, and [3]Weill Cornell Medicine, QATAR

W4B-501.b* PROTEIN ANALYSIS FROM SMALL CELL ENSEMBLES BY AN INTEGRATED MICROFLUIDIC AND MASS SPECTROMETRY ASSAY
Jorvani Cruz Villarreal, Rory Kruithoff, Robert Ros, and Alexandra Ros
Arizona State University, USA

b - Diagnostics, Drug Testing and Personalized Medicine
Testing for COVID-19, Rapid Virus Testing, Pandemic Management

M1C-181.b* SEQUENCE-SPECIFIC RECOGNITION OF SARS COV-2 WITH SOLID-STATE CRISPR-CAS12A-ASSISTED NANOPORES (SCAN)
Reza Nouri, Yuqian Jiang, Zifan Tang, Xiaojun Lance Lian, and Weihua Guan
Pennsylvania State University, USA

M1A-182.b* **ULTRASENSITIVE AND RAPID DETECTION OF COVID-19 VIRUS USING DUAL-CLAMPED SURFACE-ENHANCED-RAMAN-SCATTERING NANOSENSORS**
Kiran Kaladharan[1], Ping-Han Chen[1], Kuan-Hung Chen[1], and Fan-Gang Tseng[1,2]
[1]National Tsing Hua University, TAIWAN and [2]Academia Sinica, TAIWAN

M1B-183.b* **VALVE-ENABLED SEQUENTIAL REAGENT DELIVERY AND PAPER-BASED ENRICHMENT FOR SIMULTANEOUS DETECTION OF SARS-COV-2 AND INFLUENZA VIRUSES**
Carlos Manzanas, Md. Mahbubul Alam, Julia C. Loeb, Morteza Alipanah, John A. Lednicky, Chang-Yu Wu, and Z. Hugh Fan
University of Florida, USA

M1C-184.b **HIGH-THROUGHPUT AND HIGHLY SENSITIVE DETECTION OF SARS-CoV-2 SPIKE PROTEIN IN SALIVA WITHOUT PRETREATMENT BY USING IMMUNO-WALL MICRODEVICES**
Xiang Zhou, Toshihiro Kasama, and Ryo Miyake
University of Tokyo, JAPAN

T2B-265.b **LAB-ON-PCB TECHNOLOGY FOR HANDHELD, SAMPLE-IN-ANSWER-OUT SARS-CoV-2 DIAGNOSTIC**
Sotirios Papamatthaiou[1], Weronika Witkowska McConnell[2], Varun K.S. Kumar[1], Uroš Zupančič[1], Edward Lee-Emery[1], Mirella D. Lorenzo[1], Julien Reboud[2], Jonathan Cooper[2], Pedro Estrela[1], and Despina Moschou[1]
[1]University of Bath, UK and [2]University of Glasgow, UK

T2C-266.b **QUANTIFICATION AND KINETIC PROFILING OF ANTI-RBD ANTIBODIES IN COVID-19 SERUM AND WHOLE BLOOD USING FO-SPR PLATFORM**
Jia-Huan Qu[1], Karen Leirs[1], Wim Maes[1], Maya Imbrechts[1], Nico Callewaert[2], Nick Geukens[1], Jeroen Lammertyn[1], and Dragana Spasic[1]
[1]Katholieke Universiteit Leuven, BELGIUM and [2]AZ Groeninge Hospital, BELGIUM

T3A-373.b **DESIGN OPTIMIZATION OF MICROFLUIDIC DIAGNOSTIC DEVICES FOR THE RAPID GENETIC DETECTION OF MULTIPLE INFECTIOUS VIRUSES**
Daigo Natsuhara[1], Ryogo Saito[1], Kisuke Tanaka[1], Hiroka Aonuma[2], Tatsuya Sakurai[2], Shunya Okamoto[1], Moeto Nagai[1], Hirotaka Kanuka[2], and Takayuki Shibata[1]
[1]Toyohashi University of Technology, JAPAN and [2]Jikei University School of Medicine, JAPAN

T3B-374.b **SURFACE TENSION-MEDIATED PROCESSING OF WASTEWATER SAMPLES FOR SARS-CoV-2**
William Strike[1], Atena Amirsoleimani[1], Abisola Olaleye[1], Ann Noble[1], Kevin Lewis[1], Lee Faulkner[1], Spencer Backus[1], Sierra Lindeman[1], Katrina Eterovich[1], Melicity Fraley[1], Eli Zeitlow[2], Todd Brann[1], Shakira Hobbs[1], Joseph Monroe[1], David Hibbard[1], James Keck[1], and Scott Berry[1]
[1]University of Kentucky, USA and [2]University of Wisconsin-Platteville, USA

T3C-375.b **ADHESIVE BANDAGE FOR SARS-CoV-2 IMMUNE RESPONSE DETECTION AND SCREENING**
Imen Boumar[1], Muhammedin Deliorman[1], and Mohammad A. Qasaimeh[1,2]
[1]New York University, Abu Dhabi, UAE and [2]New York University, USA

T3A-376.b **SAMPLE-TO-ANSWER WHOLE BLOOD SEROLOGICAL TEST FOR SARS-COV-2 USING THERMALLY RESPONSIVE VALVES**
Micaela L. Everitt, David J. Boegner, and Ian M. White
University of Maryland, USA

T3B-377.b **RAPID SARS-CoV-2 TESTING WITH DUPLEXED RECOMBINASE POLYMERASE AMPLIFICATION AND A BACTERIOPHAGE INTERNAL CONTROL**
Coleman D. Martin[1], Andrew T. Bender[1], Benjamin P. Sullivan[1], Lorraine Lillis[2], David S. Boyle[2], and Jonathan D. Posner[1]
[1]University of Washington, Seattle, USA and [2]PATH, Seattle, USA

W4C-502.b* **ADAPTABLE ENGINEERING OF CELLULOSE-BASED VERTICAL FLOW ASSAYS FOR RAPID DIAGNOSTICS – THE CASE OF COVID-19**
Dousabel M.Y. Tay, Seunghyeon Kim, Emma H. Yee, Eric A. Miller, Yining Hao, and Hadley D. Sikes
Massachusetts Institute of Technology, USA

W4A-503.b **A FUNCTIONALIZED MICROWAVE SENSOR IN A MICROFLUIDIC PLATFORM FOR RAPID DETECTION OF SARS-CoV-2**
Weijia Cui, Pei Zhao, Jin Wang, Ning Qin, Emmanuel Ho, and Carolyn Ren
University of Waterloo, CANADA

W4B-504.b **DETECTION OF THE SARS-COV-2 SPIKE PROTEIN IN SALIVA WITH SHRINKY-DINK© ELECTRODES**
Julia A. Zakashansky[1], Amanda H. Imamura[2], Darwin F. Salgado II[1], Heather C. Romero Mercieca[1], Raphael F.L. Aguas[1], Angelou M. Lao[1], Joseph Pariser[1], Netzahualcóyotl Arroyo-Currás[3], and Michelle Khine[1]
[1]University of California, Irvine, USA, [2]Universidade de São Paulo, BRAZIL, and [3]Johns Hopkins School of Medicine, USA

W4C-505.b **POINT-OF-CARE ISOTHERMAL NUCLEIC ACID AMPLIFICATION PLATFORM FOR COVID-19 DIAGNOSTICS IN RESOURCE-LIMITED SETTINGS**
Ruben R.G. Soares[1], Ahmad S. Akhtar[1], Inês F. Pinto[1], Noa Lapins[1], Donal Barrett[2], Gustaf Sandh[3], Xiushan Yin[2,4,5], Vicent Pelechano[2], and Aman Russom[1]
[1]KTH Royal Institute of Technology, SWEDEN, [2]Karolinska Institute, SWEDEN, [3]Karolinska University Hospital, SWEDEN, [4]Shenyang University of Chemical Technology, CHINA, and [5]Biotech and Biomedicine Science Co. Ltd., CHINA

W4A-506.b **ROLLING CIRCLE AMPLIFICATION-ON-A-CHIP TOWARDS PORTABLE ISOTHERMAL DETECTION OF SARS-COV-2 RNA**
João C. Varela[1,3], Hower Lee[1], Narayanan Madaboosi[1,4], Aman Russom[2], João R. Mesquita[3], Mats Nilsson[1], and Ruben R.G. Soares[1,2]
[1]Stockholm University, SWEDEN, [2]KTH-Royal Institute of Technology, SWEDEN, [3]University of Porto, PORTUGAL, and [4]Indian Institute of Technology, Madra, INDIA

b - Diagnostics, Drug Testing and Personalized Medicine
Others

M1B-186.b **LATERAL CAVITY ACOUSTIC TRANSDUCER (LCAT) PLATFORM FOR STUDYING MECHANICAL PROPERTIES OF CELLS**
Lily R. McGrale, Samanta Negrete Munoz, Yu-Hsi Chen, Mohammad Aghaamoo, and Abraham P. Lee
University of California, Irvine, USA

T3C-378.b **LOW-COST, OPEN-SOURCE 3D PRINTED ANTIBODY DISPENSER FOR LATERAL FLOW ASSAY STRIP FABRICATION**
Won Han and Joong Ho Shin
Pukyong National University, KOREA

T3A-379.b **ENHANCEMENT OF LATERAL FLOW ASSAY SIGNAL INTENSITY BY PRESSURE-INDUCED FLOW DELAY**
Se Been Park and Joong Ho Shin
Pukyong National University, KOREA

W4B-507.b STUDY OF IMMISCIBLE INTERFACES FOR ON-CHIP PURIFICATION AND ISOTHERMAL AMPLIFICATION OF NUCLEIC ACIDS
Mohammad Nabil Abo-Zeid[1,2], Pablo Rodriguez-Mateos[1], Bongkot Ngamsom[1], Alexander Iles[1], Cheryl Walter[1], and Nicole Pamme[1]
[1]University of Hull, UK and [2]Assiut University, EGYPT

c - Fundamentals in Microfluidics and Nanofluidics
Acousto- and Magnetofluidics

M1C-187.c* ACOUSTIC PARTICLE FOCUSING IN POLYMER MICROFLUIDIC DEVICES
Fabian Lickert[1], Mathias Ohlin[2], Henrik Bruus[1], and Pelle Ohlsson[2]
[1]Technical University of Denmark, DENMARK and [2]AcouSort AB, SWEDEN

M1A-188.c AN ACOUSTICALLY DRIVEN PLASMA SEPARATION SYSTEM WITH SHORT PROCESS TIME AND PORTABILITY FOR POC MEDICAL DEVICES
KamalPrakash Prasanna Ravindran Nair[1,2], Thulya Chakkumpulakkal Puthan Veettil[2], Bayden R. Wood[2], Debjani Paul[2], and Tuncay Alan[1,2]
[1]Monash University, AUSTRALIA and [2]Indian Institute of Technology, Bombay, INDIA

M1B-189.c ACOUSTOFLUIDIC MECHANOPHENOTYPING OF SINGLE STEM CELLS UPON DIFFERENTIATION
Yixiang Li[1], Xiangchao Zhu[1], Le Luo[1], Stephanie Smith-Berdan[1,2], E. Camilla Forsberg[1,2], Ahmet Ali Yanik[1,2]
[1]University of California, Santa Cruz, USA and [2]California Institute for Quantitative Biosciences (QB3), USA

T2A-267.c CELL-LIKE HYDROGEL MICROPARTICLES FOR QUANTITATIVE ACOUSTOPHORESIS
Ryan Dubay[1,2], Eric M. Darling[1], and Jason Fiering[2]
[1]Brown University, USA and [2]Draper, USA

T2B-268.c ACOUSTOFLUIDIC PARTICLE MANIPULATION IN A SESSILE DROPLET WITH RESPECT TO CONTACT ANGLE
Hyeono Nam[1], Jinsoo Park[2], Hyung Jin Sung[1], and Jessie S. Jeon[1]
[1]Korea Advanced Institute of Science and Technology (KAIST), KOREA and [2]Chonnam National University, KOREA

T2C-269.c ACOUSTIC DIFFERENTIAL EXTRACTION WITH REAL-TIME FEEDBACK FOR ENHANCED SPERM CELL CAPTURE FROM SEXUAL ASSAULT KITS
Sadie M. Kiendzior, Vahid Farmehini, Nathan Swami, and James P. Landers
University of Virginia, USA

T3B-380.c ACOUSTOFLUIDIC METHOD TO ALIGN POLYSTYRENE BEADS AND CELLS IN HYDROGEL DROPLETS
Hannah Pohlit[1], Anna Fornell[1,2], Qian Shi[1], and Maria Tenje[1]
[1]Uppsala University, SWEDEN and [2]Lund University, SWEDEN

T3C-381.c MICROFLUIDIC DEVICE FOR MULTILAYER COATING OF MAGNETIC MICROPARTICLES
Amaury de Hemptinne, Iwona Ziemecka, and Wim De Malsche
Vrije Universiteit Brussel, BELGIUM

T3A-382.c ACOUSTOPHORETIC GENERATION AND MANIPULATION OF 3D MICROPARTICLE ASSEMBLIES WITHIN MICROFLUIDIC DEVICES
Amir Tahmasebipour, Matthew R. Begley, and Carl D. Meinhart
University of California, Santa Barbara, USA

W4C-508.c* **TIME-CONTROLLED MICROBEAD-BASED REACTIONS IN DROPLETS USING ACOUSTOPHORESIS**
Zhenhua Liu[1], Anna Fornell[1,2], and Maria Tenje[1]
[1]Uppsala University, SWEDEN and [2]Lund University, SWEDEN

W4A-509.c **INERTIA INDUCED BREAKDOWN OF ACOUSTIC SORTING EFFICIENCY AT HIGH FLOW RATES**
Eva Undvall[1], Fabio Garofalo[2], Giuseppe Procopio[2], Andreas Lenshof[1], Thomas Laurell[1], and Thierry Baasch[1]
[1]Lund University, SWEDEN and [2]Università di Roma La Sapienza, ITALY

W4B-510.c **TWO-PHOTON MICROSCOPY AND ACOUSTIC TRAPPING FOR THE ANALYSIS OF CELL OSMOSIS**
Bettina Sailer[1], Thomas Kellerer[2], Rune Barnkob[1], Thomas Hellerer[2], and Oliver Hayden[1]
[1]Technical University of Munich, GERMANY and [2]University of Applied Sciences, Munich, GERMANY

W4C-511.c **RAPID CELL SEPARATION AND EXTRACTION IN SESSILE BLOOD SAMPLES USING OMNIDIRECTIONAL SPIRAL SURFACE ACOUSTIC WAVES**
Naiqing Zhang, Tilvawala Gopesh, Jiaying Wang, Hemal H. Patel, and James Friend
University of California, San Diego, USA

W4A-512.c **ANTISYMMETRIC ACTUATION INCREASES ACOUSTOPHORESIS PERFORMANCE**
Klara Andersson[1], Andreas Lenshof[1], Pelle Ohlsson[2], Thomas Laurell[1]
[1]Lund University, SWEDEN and [2]AcouSort AB, SWEDEN

W4B-513.c **OPTIMISATION AND PERFORMANCE QUANTIFICATION ACOUSTIC TRAPPING USING SYNTHETIC NANOPARTICLES**
Megan Havers[1], Jakub Novotný[1,2], Jennifer Gilbert[1], Thomas Laurell[1], Mikael Evander[3], Andreas Lenshof[1]
[1]Lund University, SWEDEN, [2]Czech Academy of Sciences, CZECH REPUBLIC, and [3]AcouSort AB, SWEDEN

c - Fundamentals in Microfluidics and Nanofluidics

Capillary Microfluidics

M1C-190.c **MOST VOLUME DELIVERY OF LIQUID BY CAPILLARY PUMP**
Wei Hua, Wei Wang, Weidong Zhou, Ruige Wu, and Zhenfeng Wang
Singapore Institute of Manufacturing Technology (SIMTech), SINGAPORE

M1A-191.c* **DUALLY CONNECTED DOUBLE-CAPILLARY DEVICE FOR FABRICATING VASCULATURE-MIMETIC MICROTUBES**
Kanta Momiyama, Mai Takagi, Taiga Mitsuda, Masumi Yamada, Rie Utoh, and Minoru Seki
Chiba University, JAPAN

M1B-192.c **A HIGH-DENSITY CAPILLARY DEVICE TO STIMULATE LESS THAN 10 CELLS IN A DISH OF CONFLUENT CELLS**
Nobutoshi Ota[1], Nobuyuki Tanaka[1], Asako Sato[1], Yigang Shen[1], Yaxiaer Yalikun[1,2], and Yo Tanaka[1]
[1]RIKEN, JAPAN and [2]Nara Institute of Science and Technology, JAPAN

M1C-193.c* **3D-PRINTED LONG-TERM PASSIVE GRADIENT GENERATOR**
Ruben Dochy, Cesar Parra-Cabrera, Hans Van Cauteren, Jonas Adriaenssens, and Rob Ameloot
Katholieke Universiteit Leuven, BELGIUM

T2A-270.c **A 3D PRINTED INSTRUMENT FOR THE STRUCTURAL CHARACTERIZATION OF BIOLOGICAL MACROMOLECULES BY TAYLOR DISPERSION ANALYSIS**
Meagan R. Moser[1,2] and Christopher A. Baker[2]
[1]University of Tennessee, USA and [2]New Mexico State University, USA

T2B-271.c DESIGN AND MODEL OF A VISCOELASTIC RECTIFIER FOR EFFICIENT MICRO-PUMPING IN SKIN MOUNTABLE CAPILLARICS
Gianna Gathman, Justin Culpepper, Katie Neighbors, Hudson Gasvoda, and I. Emre Araci
Santa Clara University, USA

T2C-272.c 3-D CLOTH-BASED MICROFLUIDIC DEVICES WITH EMBEDDED SENSORS
Yohan Laffitte and Bonnie L. Gray
Simon Fraser University, CANADA

T3B-383.c ACTIVE AND PASSIVE FLOW CONTROL IN MULTILAYER CAPILLARY-DRIVEN MICROFLUIDIC DEVICES
Ilhoon Kang[1], Hyunwoong Kang[1], Simon Song[1], David S. Dandy[2], Brian J. Geiss[2], and Charles S. Henry[2]
[1]Hanyang University, KOREA and [2]Colorado State University, USA

T3C-384.c OSTE PILLAR FOREST FABRICATED BY DOUBLE REPLICA MOLDINGS OF LASER-CUT PMMA MOLD
Yuqian Yang, Zhiqing Xiao, Lexin Sun, Sihan Dai, Hao Yang, Xingwei Zhang, Chia-Lin Sheu, and Weijin Guo
Shantou University, CHINA

T3A-385.c MODELING WICKING THROUGH LASER-ETCHED GROOVES IN PAPER
Sidharth Modha, Bhargav Rallabandi, and Hideaki Tsutsui
University of California, Riverside, USA

W4C-514.c HIGH VELOCITY CAPILLARY PUMPING
Jean Berthier, Jing J. Lee, Ashley M. Dostie, Erwin Berthier, and Ashleigh B. Theberge
University of Washington, USA

W4A-515.c MUTILSCALE MODELLING OF CAPILLARY IMBIBITION IN 3D PRINTED LAB-ON-CHIPS
Agnes Piovesan, Tibo Arens, Bart Dequeker, Clement Achille, Ruben Dochy,
Cesar Parra Cabrera, Pieter Verboven, Rob Ameloot, and Bart Nicolai
Katholieke Universiteit Leuven, BELGIUM

W4B-516.c CAPILLARY-DRIVEN MICROFLUIDIC DEVICE FOR IMMUNOASSAYS USING HYDROPHILIC MODIFIED PDMS
Pedro G.M. Condelipes[1], Virginia Chu[1], and João Pedro Conde[1,2]
[1]Instituto de Engenharia de Sistemas e Computadores – Microsistemas e Nanotecnologias (INESC MN), PORTUGAL and [2]Universidade de Lisboa, PORTUGAL

W4C-517.c OPEN MICROFLUIDIC CHANNEL DESIGN FOR PASSIVE MONODISPERSE DROPLET GENERATION AND MANIPULATION
Jian Wei Khor[1], Ulri N. Lee[1], Jean Berthier[1], Erwin Berthier[1], and Ashleigh B. Theberge[1,2]
[1]University of Washington, USA and [2]University of Washington School of Medicine, USA

W4A-518.c MATRIGEL CAPILLARITY- DRIVEN FILLING IN OPEN MICROFLUIDICS FOR HIGH-THROUGHPUT DRUG SCREENING ON 3D PATIENT DERIVED ORGANOIDS CULTURES
Elena Bianchi[1], Paola De Stefano[1], Oronza A. Botrugno[2], Pietro Oldani[1], Luca Leoni[1],
Monica Piergiovanni[1], Giovanni Tonon[2], and Gabriele Dubini[1]
[1]Politecnico di Milano, ITALY and [2]IRCCS San Raffaele Scientific Institute, ITALY

c - Fundamentals in Microfluidics and Nanofluidics
Centrifugal Microfluidics

M1A-194.c* **A CENTRIFUGAL MICROFLUIDIC METHOD FOR ENRICHMENT AND ENZYMATIC EXTRACTION OF SARS-COV-2 RNA FROM CLINICAL SAMPLES**
Rachelle Turiello[1], Leah M. Dignan[1], Brayton Thompson[1], Melinda Poulter[1], Jeff Hickey[2], Jeff Chapman[2], and James P. Landers[1,2]
[1]University of Virginia, USA and [2]MicroGEM International, PLC, USA

T2A-273.c **THE DEVELOPMENT OF A CENTRIFUGAL MICROFLUIDIC VERTICAL FLOW IMMUNOASSAY TO DETECT BIOLOGICAL WARFARE AGENTS**
Scott Karas[1], M. Shane Woolf[1], Haley L. DeMers[2], Derrick Hau[2], Marcellene A. Gates-Hollingsworth[2], David AuCoin[2], and James P. Landers[1]
[1]University of Virginia, USA and [2]University of Nevada, USA

T2B-274.c **MICROFLUIDIC DEVICE FOR THE IDENTIFICATION OF BIOLOGICAL SEX BY ANALYSIS OF LATENT FINGERMARK DEPOSITS**
Jamila S. Marshall[1], Madelyn L. Sita[1], and James P. Landers[1,2]
[1]University of Virginia, USA and [2]MicroLab Inc., USA

T2C-275.c **PROGRAMMABLE DENSITY-BASED FRACTIONATION IN CENTRIFUGAL MICROFLUIDICS**
Daniel Brassard, Liviu Clime, Byeong-Ui Moon, Keith Morton, and Teodor Veres
National Research Council Canada, CANADA

T3B-386.c **3D NANOPRINTED MULTI-DIRECTIONAL CAPILLARY VALVES**
Olivia M. Young[1], Andrew Frommer[1], Michael A. Restaino[1], Daniel L. Jean[2], Harvey Tsang[2], Gabriel L. Smith[2], Ryan D. Sochol[1]
[1]University of Maryland, USA and [2]US Army Research Laboratory, USA

T3C-387.c **DETERMINATION AND COLLECTION OF WATER-SOLUBLE DYES ON A CENTRIFUGAL PLATFORM**
Chih-Hsin Shih and Chao-Hui Ke
Feng Chia University, TAIWAN

T3A-388.c **AN INTEGRATED CENTRIFUGAL MICROFLUIDIC PLATFORM FOR MULTIPLEXED COLORIMETRIC IMMUNODETECTION OF PROTEIN BIOMARKERS IN RESOURCE-LIMITED SETTINGS**
Ahmad S. Akhtar, Inês F. Pinto, Ruben R.G. Soares, and Aman Russom
KTH Royal Institute of Technology, SWEDEN

W4B-519.c **AQUEOUS TWO-PHASE SYSTEM-ASSISTED BLOOD FRACTIONATION AND CELL ISOLATION IN CENTRIFUGAL MICROFLUIDICS**
Byeong-Ui Moon, Liviu Clime, Daniel Brassard, Alex Boutin, Jamal Daoud, Keith Morton, and Teodor Veres
National Research Council Canada, CANADA

W4C-520.c **MICROFLUIDIC-BASED MOLECULAR ANALYSIS OF PLANT PESTS FOR INSECTICIDE RESISTANCE MANAGEMENT (SUPERPESTS-DISK)**
Desirée Baumgartner[1], Benita Johannsen[2], Nils Paust[1,2], Felix von Stetten[1,2], Roland Zengerle[1,2], Konstantinos Mavridis[3], John Vontas[3,4], and Konstantinos Mitsakakis[1,2]
[1]University of Freiburg, GERMANY, [2]Hahn-Schickard, GERMANY, [3]Foundation for Research & Technology-Hellas, GREECE, and [4]Agricultural University of Athens, GREECE

W4A-521.c ENRICHMENT OF PERIPHERAL BLOOD MONONUCLEAR CELLS FROM LARGE VOLUMES OF BLOOD USING CENTRIFUGAL MICROFLUIDICS
Liviu Clime, Lidija Malic, Daniel Brassard, Mojra Janta, Caroline Miville-Godin, Dillon Da Fonte, Christina Nassif, and Teodor Veres
National Research Council, CANADA

W4B-522.c DETERMINING BINDING KINETICS OF A PCT LATERAL FLOW ASSAY DURING RUNTIME
Daniel M. Kainz[1,2], Bastian J. Breiner[1], Roland Zengerle[1,2], Nils Paust[1,2], Tobias Hutzenlaub[1,2], and Susanna M. Früh[1,2]
[1]Hahn-Schickard, GERMANY and [2]University of Freiburg, GERMANY

W4C-523.c SIMULTANEOUS PRODUCTION AND SORTING OF HIGHLY VISCOUS ALGINATE MICROCAPSULES IN CENTRIFUGAL SYSTEM FOR TYPE I DIABETES APPLICATIONS
Matei Badalan, Frederic Bottausci, Giovanni Ghigliotti, Jean Luc Achard, and Guillaume Balarac
University Grenoble Alpes, FRANCE

c - Fundamentals in Microfluidics and Nanofluidics
Digital Microfluidics

M1B-195.c ENHANCED BIOMOLECULAR BINDING TO BEADS ON A DIGITAL MICROFLUIDIC DEVICE
Shruti Preetam, Yaas Bigdeli, and Richard B. Fair
Duke University, USA

M1C-196.c DROPLET-BASED MICROFLUIDIC NEEDLE FOR NUROTRANSMITTER SAMPLING AND DETECTION
Cong Ma[1,2,3], Yaru Huang[1,4], Yuhang Huang[1,4], Haoran Hu[1,5], Chunping Jia[1], Jianlong Zhao[1], and Shilun Feng[1,3]
[1]Chinese Academy of Sciences (CAS), CHINA, [2]ShanghaiTech University, CHINA, [3]University of Chinese Academy of Sciences, CHINA, [4]Shanghai Normal University, CHINA, and [5]Wenzhou Medical University, CHINA

M1A-197.c* HIGH VIABILITY TRANSFECTION OF MAMMALIAN CELLS USING TRI-DROPLET ELECTROPORATION ON DIGITAL MICROFLUIDICS
Samuel R. Little[1], Alison Hirukawa[2], Angela Quach[1], Phillipe Vo[2], Andrew Chin[2], Hugo Sinha[2], and Steve C.C. Shih[1]
[1]Concordia University, CANADA and [2]Drop Genie, USA

M1B-198.c* CORE-SHELL HYDROGEL PARTICLES WITH TUNABLE POROSITY FOR DIGITAL NUCLEIC ACID ASSAYS
Michael T. Bogumil, Jonathan Omens, and Dino Di Carlo
University of California, Los Angeles, USA

T2A-276.c ACTIVE-MATRIX DIGITAL MICROFLUIDICS PLATFORM FOR SINGLE CELL GENERATION AND MANIPULATION
Siyi Hu[1], Subao Shi[2], Jingmin Ye[2], Chuyu Chen[2], Dongping Wang[1], and Hanbin Ma[1]
[1]Chinese Academy of Sciences (CAS), CHINA and [2]Guangdong ACXEL Micro & Nano Tech Co., Ltd., CHINA

T2B-277.c RAPID DETECTION OF *COVID-19 VIRUS* BY DIGITAL PCR BASED ON MICROCAVITY ARRAY
Yaru Huang[1,4], Yimeng Sun[1], Cong Ma[1,2,3], Yuhang Huang[1,4], Haoran Hu[1,5], Chunping Jia[1], Jianlong Zhao[1], and Shilun Feng[1]
[1]Chinese Academy of Sciences (CAS), CHINA, [2]ShanghaiTech University, CHINA, [3]University of Chinese Academy of Sciences, CHINA, [4]Shanghai Normal University, CHINA, and [5]Wenzhou Medical University, CHINA

T3B-389.c **A SMARTPHONE-INTEGRATED DIELECTROPHORECTIC PLATFORM FOR RAPID AND IN-SITU MONITORING OF ENVIRONMENTAL WATER QUALITY THROUGH LAMP ASSAYS**
Si Kuan Thio[1], Sung Woo Bae[1], and Sung-Yong Park[2]
[1]National University of Singapore, SINGAPORE and [2]San Diego State University, USA

W4A-524.c **MINIMUM ACTUATABLE DROPLET VOLUME IN SINGLE-PLATE DIGITAL MICROFLUIDICS DEVICES WITH ALL-GROUNDED ELECTRODES**
Malik Al-Lababidi and Mohamed Abdelgawad
American University of Sharjah, UAE

c - Fundamentals in Microfluidics and Nanofluidics

Droplet Microfluidics

M1C-199.c **DYNAMIC GOLD ELECTRODE STABILITY WHEN EXPOSED TO ALTERNATING VOLTAGE IN MICROFLUIDIC SYSTEMS**
Qi Wang, Shuren Song, Wei Wang, Jia Zhou, and Antoine Riaud
Fudan University, CHINA

M1A-200.c **ELIMINATING REINJECTION- DROPLET GENERATION AND SORTING IN THE SAME CHIP**
Utpal Saha, Bruce Gale, and Raheel Samuel
University of Utah, USA

M1B-201.c* **DROPLET MICROFLUIDICS FOR STUDIES OF BACTERIAL GENETIC TRANSFORMATION IN STREPTOCOCCUS PNEUMONIAE**
Trinh Lam, Donald A. Morrison, and David T. Eddington
University of Illinois, Chicago, USA

M1C-202.c* **REASSESSING MICRODROPLETS AS A PLATFORM FOR SINGLE-CELL ANALYSIS**
Yuta Nakagawa[1], Shinsuke Ohnuki[1], Naoko Kondo[1], Akihiro Isozaki[1], Yoshikazu Ohya[1], and Keisuke Goda[1,2,3]
[1]University of Tokyo, JAPAN, [2]University of California, Los Angeles, USA, and [3]Wuhan University, USA

M1A-203.c* **MICROFLUIDIC DROPLET REACTOR FOR ARTIFICIAL ORGANELLE GENERATION**
Sumit Kumar[1,2], Mamata Karmacharya[1,2], and Yoon-Kyoung Cho[1,2]
[1]Ulsan National Institute of Science and Technology, KOREA and [2]Institute for Basic Science (IBS), KOREA

M1B-204.c **HEMAGGLUTINATION ASSAY TO QUANTIFY INFLUENZA A VIRUS LIKE PARTICLES IN DROPLETS**
Merve Marcali, Marc G. Aucoin, and Carolyn Ren
University of Waterloo, CANADA

M1C-205.c* **HIGH-THROUGHPUT MICROFLUIDICS FOR THE SCREENING AND SORTING OF SUPERIOR CELLULASE ACTIVITY IN YEAST**
Hangrui Liu, Kai Peng, James A. Piper, and Ming Li
Macquarie University, AUSTRALIA

M1A-206.c* **THEORETICAL, COMPUTATIONAL AND EXPERIMENTAL CHARACTERIZATION OF SHEAR-DEPENDENT MICRO-VORTICES IN LIQUID—LIQUID FLOW-FOCUSING GEOMETRY**
Marzieh Ataei, Mohammad Aghaamoo, Gopakumar Kamalakshakurup, and Abraham P. Lee
University of California, Irvine, USA

M1B-207.c PARALLELED DROPLET DIGITAL LOOP-MEDIATED ISOTHERMAL AMPLIFICATION (ddLAMP) BASED ON A HAND POWERED MICROFLUIDICS
Hao Yuan[1], Jingxuan Tian[2], Yuh-Shiuan Chien[1], and Chien-Fu Chen[1]
[1]National Taiwan University, TAIWAN and [2]University of Hong Kong, HONG KONG

M1C-208.c* ENHANCING THE DETECTION SIGNALS OF CELL-LADEN MICRODROPLETS BY OSMOSIS
Siyuan Zhuang, Hangrui Liu, and Ming Li
Macquarie University, AUSTRALIA

M1A-209.c* ASSEMBLY AND PURIFICATION OF DNA STRUCTURES IN AQUEOUS-AQUEOUS TWO-PHASE EMULSION
Marcos Masukawa[1], Yukiko Okuda[1], Fujio Yu[1], Yusuke Sato[2], Kanta Tsumoto[3], Kenichi Yoshikawa[4], and Masahiro Takinoue[1]
[1]Tokyo Institute of Technology, JAPAN, [2]Tohoku University, JAPAN, [3]Mie University, JAPAN, and [4]Doshisha University, JAPAN

M1B-210.c ELECTRONICALLY STIMULATED SEGMENTED FLOW FOR REDUCED SAMPLE CONSUMPTION DURING SERIAL FEMTOSECOND CRYSTALLOGRAPHY
Diandra Doppler[1], Mukul Sonker[1], Ana Egatz-Gomez[1], Garrett Nelson[1], Mohammad Towshif Rabbani[1], Jorvani Cruz Villarreal[1], Reza Nazari[1], Sahba Zaare[1], Darren Thifault[1], Sabine Botha[1], Thomas Grant[2], Petra Fromme[1], Richard Kirian[1], and Alexandra Ros[1]
[1]Arizona State University, USA and [2]Jacobs School of Medicine and Biomedical Sciences, USA

M1C-211.c WETTING AND DE-WETTING TRANSITION ON CHEMICALLY STRUCTURED SURFACE FOR THE APPLICATION IN DROPLET BASED ENERGY HARVESTING: A THEORETICAL APPROACH
Shalini, Dhiman Mallick, and Ankur Goswami
Indian Institute of Technology, Delhi, INDIA

M1A-212.c DROPLET-BASED DIFFERENTIAL SCANNING CALORIMETRY SYSTEM FOR PROTEIN THERMAL ANALYSIS
Hanliang Zhu[1], Sheng Ni[2], Levent Yobas[2] and Pavel Neuzil[1]
[1]Northwestern Polytechnical University, CHINA and
[2]Hong Kong University of Science and Technology, CHINA

T2C-278.c LAYERED BIOMIMETIC MICROGELS FOR 3D CELL CULTURE
Bruna G. Carvalho[1], Franciele F. Vit[1], Hernandes F. Carvalho[1], Sang W. Han[2], and Lucimara G. de la Torre[1]
[1]University of Campinas, BRAZIL and [2]São Paulo Federal University, BRAZIL

T2A-279.c A LIQUID-LIQUID PHASE SEPARATOR
Xi-Lun Wang[1], Penjit Srinophakun[2], and Ya-Yu Chiang[1]
[1]National Chung-Hsing University, TAIWAN and [2]Kasetsart University, THAILAND

T2B-280.c CONTROLLED GENERATION OF CORE-SHELL GELMA MICROGEL USING A MULTI-LAYER DROPLET-BASED MICROFLUIDIC DEVICE
Zahra Taravatfard, Masoud Madadelahi, Mallar Ray, and Sergio O. Martinez-Chapa
Tecnologico de Monterrey, MEXICO

T2C-281.c SENSITIVE ABSORBANCE MEASUREMENT IN DROPLET MICROFLUIDICS *VIA* MULTIPASS FLOW CELLS
Bingyuan Lu, Adrian M. Nightingale, and Xize Niu
University of Southampton, UK

T2A-282.c AN IN SITU DROPLET MICROFLUIDICS BASED AMMONIUM SENSOR AND ITS APPLICATION TO A SEQUENTIAL BATCH BIOREACTOR
Wahida T. Bhuiyan[1], Carla Ruggiero[2], Seongbong Heo[1], Akash Srivastava[2], Brett Warren[2], Yongqiang Liu[1], Adrian Nightingale[1], and Xize Niu[1,2]
[1]University of Southampton, UK and [2]SouthWestSensor Ltd, UK

T2B-283.c ACCLERATED MICROFLUIDIC STUDIES OF CATION-DOPED LEAD HALIDE PEROVSKITE QUANTUM DOTS
Fazel Bateni, Robert W. Epps, Kameel Antami, and Milad Abolhasani
North Carolina State University, USA

T2C-284.c MULTIPHASE MICROFLOW MAPPING *via* DEFOCUSING micro-PTV
Evan Lammertse[1], Nikhil Koditala[2], Martin Sauzade[1], Hongxiao Li[2], Jun Kong[2], and Eric Brouzes[1]
[1]Stony Brook University, USA and [2]Georgia State University, USA

T2A-285.c 3D PRINTED MICROFLUIDICS FOR DROPLET GENERATION
Anupama Phatak, Crystal E. Owens, and A. John Hart
Massachusetts Institute of Technology, USA

T2A-530.c COMBINED PRESSURE AND FLOW RATE CONTROL FOR AUTOMATED SERIAL PICOINJECTION
Jolien Breukers, Hannah Op de Beeck, Hans Gerstmans, Iene Rutten, and Jeroen Lammertyn
Katholieke Universiteit Leuven, BELGIUM

T2B-286.c DROPLET BASED SURFACE ENHANCED RAMAN SPECTROSCOPY FOR THE POTENTIAL DETECTION OF SYNTHETIC OPIOID PRODUCTION
Rustin Y. Mirsafavi[1], Chrysafis Andreou[2], Steven J. Tobin[3], Ben D. Gardner[3], Martin Moskovits[1], Carl Meinhart[1]
[1]University of California, Santa Barbara, USA, [2]University of Cyprus, CYPRUS, and [3]Collins Aerospace, USA

T3C-390.c IMPROVED EFFECTIVE SURFACE TENSION MEASUREMENT USING LEVITATION-FREE OSCILLATING LIQUID MARBLES
Pradip Singha, Nhat-Khuong Nguyen, Jun Zhang, Nam-Trung Nguyen, and Chin Hong Ooi
Griffith University, AUSTRALIA

T3A-391.c A DISPOSABLE CAPACITIVE ELECTRICAL DROPLET MEASUREMENT
Junhyeong Kim, Hyungseok Cho, and Ki-Ho Han
Inje University, KOREA

T3B-392.c MICRODROPLET INNER ROTATION CONTROL BY PARALLEL CARRIER FLOW OF DIFFERENT OILS, SESAME AND SILICONE
Hibiki Yoshimura, Daiki Tanaka, Tetsushi Sekiguchi, and Shuichi Shoji
Waseda University, JAPAN

T3C-393.c MEASURING THE HOLDING FORCES OF OPTOFLUIDIC TWEEZERS
Minye Yang[1], Birgit Schlager[2], and Amar S. Basu[1]
[1]Wayne State University, USA and [2]Graz University of Technology, AUSTRIA

T3A-394.c FACILE GENERATION OF 3D SPHEROIDS USING A THIOL-ACRYLATE HYDROGEL SCAFFOLD IN A MICROFLUIDIC DROPLET TRAPPING ARRAY
Anowar H. Khan, Khashayar R. Bajgiran, Margaret Moe, Haley R. Lassiter, James A. Dorman, Elizabeth C. Martin, John A. Pojman, and Adam T. Melvin
Louisiana State University, USA

T3B-395.c **A PLUG-AND-PLAY MODULAR MICROCAPILLARY PLATFORM FOR THE GENERATION OF MULTICOMPARTMENTAL DOUBLE EMULSIONS USING GLASS OR FLUOROCARBON CAPILLARIES**
Sean Farley, Kaitlyn Ramsay, and Katherine S. Elvira
University of Victoria, CANADA

T3C-396.c **SIMPLIFIED FORMATION OF THIN-SHELL DOUBLE EMULSIONS FOR ROBUST SINGLE ENTITY ANALYSIS**
Thomas Cowell, Andrew Dobria, Hee-Sun Han
University of Illinois, Urbana-Champaign, USA

T3A-397.c **A RAPID AND INEXPENSIVE WETTABILITY PATTERNING METHOD FOR GENERATING DOUBLE EMULSIONS BY MICROFLUIDICS**
Hangrui Liu, James A. Piper, and Ming Li
Macquarie University, AUSTRALIA

W4B-525.c **RADIOPHARMACEUTICAL SYNTHESIS IN MICRODROPLETS: FROM HIGH-THROUGHPUT SYNTHESIS OPTIMIZATION TO CLINICAL-SCALE PRODUCTION**
Alejandra Rios, Travis S. Holloway, and R. Michael van Dam
University of California, Los Angeles, USA

W4C-526.c **TRANSPORT OF SUB-NANOLITER VOLUME DROPLETS BY ELECTROWETTING-ON-DIELECTRICS IN AIR**
Emma J.M. Moonen[1], Eduard Pelssers[1,2], and Jaap M.J. den Toonder[1]
[1]Eindhoven University of Technology, NETHERLANDS and [2]Philips Research, NETHERLANDS

W4A-527.c **RECOVERY AND ISOLATION OF INDIVIDUAL MICROFLUIDIC DROPLETS BY TRIGGERED DEPOSITION**
Thomas Weber[1], Sundar Hengoju[1], Ashkan Samimi[1], Miguel Tovar[1], Martin Roth[1], and Miriam A. Rosenbaum[1,2]
[1]Hans Knöll Institute, GERMANY and [2]Friedrich Schiller University, GERMANY

W4B-528.c **STATIC QUASI-DOUBLE-EMULSION DROPLETS AS MICROCRYSTALLIZERS FOR CONTROL OF CRYSTAL POLYMORPHISM**
Yin Wu[1], Yanwu Liu[2], Qiang Zhao[1], and Gang Li[1]
[1]Chongqing University, CHINA and [2]Chongqing Medical University, CHINA

W4C-529.c **DIGITAL DETECTION AND QUANTIFICATION OF SARS-CoV-2 IN A DROPLET MICROFLUIDIC ALL-FIBER DEVICE**
Sanghamitra Sengupta[1], Helen E. Parker[1], Achar V. Harish[1], Ruben R. G. Soares[2], Haakan N. Joensson[2], Walter Margulis[1,3], Aman Russom[2], and Fredrik Laurell[1]
[1]KTH Royal Institute of Technology, SWEDEN and [2]Research Institutes of Sweden (RISE), SWEDEN

W4B-531.c **MAPPING THE ICE-NUCLEATING PROPERTIES OF MINERAL SURFACES USING DROPLET MICROFLUIDICS**
Mark D. Tarn[1], Katherine Bastin[2], Sebastien N.F. Sikora[1], Fiona C. Meldrum[1], Hugo K. Christenson[1], Benjamin J. Murray[1], and Mark A. Holden[2]
[1]University of Leeds, UK and [2]University of Central Lancashire, UK

W4C-532.c **DROPLET-ON-DEMAND AT POINT OF SAMPLING**
Adrian M. Nightingale
University of Southampton, UK

W4A-533.c* **LONGITUDINAL ORDERING OF MICROFLUIDIC DROPS USING INERTIAL FORCES**
Wenyang Jing and Hee-Sun Han
University of Illinois, Urbana-Champaign, USA

W4B-534.c* **OLIGONUCLEOTIDE FUNCTIONALIZED POLYACRYLAMIDE BEADS FOR AMPLIFICATION BASED BIOMARKER DETECTION**
Rodrigo Cotrim Chaves and Aaron Streets
University of California, Berkeley, USA

W4C-535.c* **DROPLET-BASED MICROFLUIDIC PLATFORM FOR VISCOSITY MEASUREMENT OVER EXTENDED CONCENTRATION RANGE**
Paul Cochard-Marchewka, Nicolas Bremond, and Jean Baudry
Université Paris Sciences et Lettres, FRANCE

W4A-536.c **DROPLET ELECTRO-COALESCENCE BASED ON LIGHT-INDUCED VIRTUAL ELECTRODES**
Riccardo Zamboni, Jörg Imbrock, and Cornelia Denz
University of Muenster, GERMANY

c - Fundamentals in Microfluidics and Nanofluidics
Electrokinetic Phenomena

M1B-213.c* **IMPROVING THE COVERAGE AND STABILITY OF MICROCHANNEL SURFACE COATINGS USING AUTOMATED ZETA POTENTIAL ANALYSIS**
Austin Abrams, Alexander Eden, David E. Huber, Lingyun Zhou, and Sumita Pennathur
University of California, Santa Barbara, USA

T2C-287.c **TOWARDS ZETA POTENTIAL CHARACTERIZATION OF MICROBES FOR ELECTRODEPOSITION WITH COMMERCIAL MICROFLUIDIC CHIPS**
Jonathan Cottet, Josephine O. Oshodi, Ariel L. Furst, and Cullen R. Buie
Massachusetts Institute of Technology, USA

T2A-288.c **DYNAMIC AND PRICISE MANIPULATION ELECTROKINETICALLY PRECONCENTRATED MULTIPLE PLUGS OF BIOMOLECULES**
Sinwook Park, Barak Sabbagh, Ramadan Abu-Rjal, and Gilad Yossifon
Technion–Israel Institute of Technology, ISRAEL

T2B-289.c **ENTRANCE EFFECTS ON PARTICLE ELECTROPHORETIC BEHAVIOR IN NANOPORE RESISTIVE PULSE SENSING**
Chien Hsu[1], Chih-Yuan Lin[2], Amer Alizadeh[1], Hirofumi Daiguji[1], and Wei-Lun Hsu[1]
[1]University of Tokyo, JAPAN and [2]National Taiwan University, TAIWAN

T2C-290.c **ACTIVE ANALYTE MANIPULATION IN MICRODROPLETS VIA SELECTIVE CHARGE TRANSPORT THROUGH NANOPOROUS MEMBRANES**
Sungu Kim, Aparna Krishnamurthy, Baskar Ganapathysubramanian, and Robbyn K. Anand
Iowa State University, USA

T2A-291.c **INTEGRATION OF ELECTROKINETIC ENRICHMENT OF SPIKE PROTEIN WITH A LATERAL FLOW ASSAY**
Kira L. Rahn, Sommer Y. Osman, and Robbyn K. Anand
Iowa State University, USA

T3B-398.c **AN INTEGRATED MICROFLUIDIC PROBE FOR CYTOPLASMIC BIOPSY OF SINGLE ADHERENT CELLS**
Samuel Sofela[1], Ayoola Brimmo[1,2], and Mohammad A. Qasaimeh[1,2]
[1]New York University, Abu Dhabi, UAE and [2]New York University, USA

T3C-399.c **NANOPARTICLE AND NANO-VESICLE SEPARATION USING ELECTROKINETIC BIASED DETERMINISTIC LATERAL DISPLACEMENT MICRO-CHANNELS**
Victor Calero, Richard J. Gillams, and Hywel Morgan
University of Southampton, UK

T3A-400.c **DIELECTROPHORESIS REVEALS THE DISTINCT BIOELECTRIC SIGNATURES OF COLORECTAL CANCER CELLS DEPEND ON PLOIDY AND NUCLEAR VOLUME**
Josie L. Duncan, Mathew Bloomfield, Daniela Cimini, and Rafael V. Davalos
Virginia Tech, USA

T3B-401.c **AUTOMATIC DETERMINATION OF TRAPPING VOLTAGE IN DIRECT-CURRENT INSULATOR-BASED ELECTROKINETIC DEVICES**
J. Martin de los Santos-Ramirez[1], Rodrigo Ruz-Cuen[1], Braulio Cardenas-Benitez[3], Cinthia J. Ramirez-Murillo[1], Abbi Miller[2], Kel Hakim[2], Blanca H. Lapizco-Encinas[2], and Victor H. Perez-Gonzalez[2]
[1]Tecnológico de Monterrey, MEXICO, [2]Rochester Institute of Technology, USA, and [3]University of California, Irvine, USA

W4B-537.c **ACCURATELY DETERMINATION OF THE SURFACE CHARGE DENSITY BY A COUPLED NONLINEAR MULTIPHYSICS MODEL**
Daming Chen[1], Jiao Fu[2], Qin Lu[2], and Amador M. Guzmán[3]
[1]Universidad de Santiago de Chile, CHILE, [2]Xi'an University of Posts and Telecommunications, CHINA, and [3]Universidad Diego Portales, CHINA

W4C-538.c* **ELECTROCHEMICAL DETECTION OF NUCLEIC ACIDS AFTER ENRICHMENT BY OUT-OF-PLANE FARADAIC ION CONCENTRATION POLARIZATION**
Umesha Peramune, Beatrise Berzina, Sungu Kim, Echo DeVries, Baskar Ganapathysubramanian, and Robbyn K. Anand
Iowa State University, USA

c - Fundamentals in Microfluidics and Nanofluidics
Modeling/Numerical Simulation

M1C-214.c **A CONTINUOUS MODEL FOR MAGNETIC PARTICLES FLOWS VALID FROM DILUTE TO PACKED SUSPENSIONS**
Simon Dumas and Stéphanie Descroix
Institut Curie, FRANCE

T2B-292.c **DETERMINISTIC LATERAL DISPLACEMENT *VIA* SELF ASSEMBLY-BASED HEXAGONALLY ARRANGED TRIANGULAR POSTS**
Talha Razaulla[1], Olivia Young[2], Abdullah T. Alsharhan[2], Ryan D. Sochol[2], and Roseanne Warren[1]
[1]University of Utah, USA and [2]University of Maryland, USA

T2C-293.c **STUDY ON HEMOSTATIC MECHANISM OF RAPID "SUTURE" OF ARTERY AT HIGH TEMPERATURE BASED ON ENERGETIC DEVICES**
Yi Sun, Wenzhong Lou, Bo He, Yuecen Zhao, and Hengzhen Feng
Beijing Institute of Technology, CHINA

T2A-294.c **QUORUM SENSING IN SINGLE CELLS OF NEUROSPORA CRASSA**
Xiao Qiu, Jia Hwei Cheong, Yang Liu, Leidong Mao, Heinz-Bernd Schüttler, and Jonathan Arnold
University of Georgia, USA

T2B-295.c A HYBRID SPIRAL MICROFLUIDIC PLATFORM FOR SEPARATION OF CIRCULATING TUMOR CELLS
Rana Altay[1], Ali Kosar[1,2], and Murat Kaya Yapici[1,2,3]
[1]Sabanci University, TURKEY, [2]Center of Excellence for Functional Surfaces and Interfaces for Nano-Diagnostics, TURKEY, and [3]University of Washington, USA

T3C-402.c SIMULATING MICROSCALE INTERFACE DYNAMICS ON A DOUBLY PERIODIC SMOOTH ROUGH SURFACE
Pawan Kumar and Dalton J.E. Harvie
University of Melbourne, AUSTRALIA

T3A-403.c NUMERICAL STUDY OF ACOUSTIC STREAMING ON THE REDUCTION OF TAYLOR-ARIS DISPERSION FOR CHROMATOGRAPHIC APPLICATIONS
Pierre Gelin[1], Eiko Westerbeek[1], Jan Eijkel[2], Wouter Olthuis[2], Dominique Maes[1], and Wim De Malsche[1]
[1]Vrije Universiteit Brussel, BELGIUM and [2]University of Twente, NETHERLANDS

T3B-404.c OBSERVATION OF A ROTATING INTERFACE IN SIDE-BY-SIDE FLOW OF TWO AQUEOUS SOLUTIONS WITH INITIALLY EQUAL DENSITY INSIDE MICROCHANNELS
Pooyan Heravi, Li-An Chu, and Da-Jeng Yao
National Tsing Hua University, TAIWAN

T3C-405.c UNREACTED PCR PRIMERS INHIBIT SIGNAL IN A NUCLEIC ACID LATERAL FLOW ASSAY: A TRANSPORT REACTION MODEL ELUCIDATES
Priyanka Agarwal and Bhushan J. Toley
Indian Institute of Science, Bangalore, INDIA

W4A-539.c PREDICTING ION CONCENTRATION POLARIZATION IN SHORT NANOCHANNEL
Fatima Flores-Galicia, François-Damien Delapierre, Antoine Pallandre, and Anne-Marie Haghiri-Gosnet
Université Paris-Saclay, FRANCE

W4B-540.c MODELING OF A DIELECTROPHORESIS-BASED MICROFLUIDIC CHIP FOR CELL TRAPPING
Malihe Farasat, Mohsen Mashhadi, and Majid Badieirostami
University of Tehran, IRAN

c - Fundamentals in Microfluidics and Nanofluidics
Nanofluidics/Nanofluidic Phenomena

M1A-215.c A PLATFORM FOR HIGH-SPEED NANOPORE RECORDINGS AS A FUNCTION OF TEMPERATURE.
Dmytro Lomovtsev, Matthew Waugh, Liqun He, Raphael St-Gelais, and Vincent Tabard-Cossa
University of Ottawa, CANADA

T2C-296.c VIRUS CAPSID ASSEMBLY MONITORED IN REAL TIME WITH RESISTIVE-PULSE SENSING COUPLED DIRECTLY TO THE REACTION CHAMBER
Michael P. Kappler, Caleb Starr, Adam Zlotnick, and Stephen C. Jacobson
Indiana University, USA

T2A-297.c CARBON NANOTUBE-BASED IONIC DIODE
Ran Peng[1,2], Yueyue Pan[2], Biwu Liu[3], Zhi Li[3], Peng Pan[2], Shuailong Zhang[2], Zhen Qin[2], Aaron R. Wheeler[2], Shirley Tang[3], and Xinyu Liu[2]
[1]Dalian Maritime University, CHINA, [2]University of Toronto, CANADA, and [3]University of Waterloo, CANADA

T3A-406.c **DIRECT MEASUREMENT OF PRESSURE-DRIVEN LIQUID FLOW IN TWO-DIMENSIONAL 30 NM CHANNEL**
Koki Yamamoto and Yo Tanaka
RIKEN, JAPAN

T3B-407.c **RESOLVING HEPATITIS B VIRUS CAPSIDS WITH A SINGLE AMINO ACID MUTATION BY MULTIPORE RESISTIVE-PULSE SENSING**
Sheng-Yuan Huang, Zhongchao Zhao, Mi Zhang, Adam Zlotnick, and Stephen C. Jacobson
Indiana University, USA

T3C-408.c **NANOFLUIDIC INTERFACIAL MEMRISTOR MIMIC SYNAPTIC PLASTICY**
Yechang Guo[1], Han Xu[1], Pan Zhang[1], and Wei Wang[1,2]
[1]Peking University, CHINA and [2]National Key Laboratory of Science and Technology on Micro/Nano Fabrication, CHINA

c - Fundamentals in Microfluidics and Nanofluidics
Others

M1B-216.c* **KINETIC ENHANCEMENT OF RECEPTOR–LIGAND INTERACTIONS IN MODULAR GLASS MICROFLUIDIC BIOASSAY DEVICES**
Shivani Sathish and Amy Q. Shen
Okinawa Institute of Science and Technology Graduate University, JAPAN

M1C-217.c **THROUGH-CHANNEL MICROSCOPY REVEALS NOVEL ELASTO-INERTIAL FOCUSING PATTERNS**
Jian Zhou and Ian Papautsky
University of Illinois, Chicago, USA

T3A-409.c **µTESLA 3: MECHANISM OF SURFACE TEXTURE ENHANCED BOUNDARY LAYER PUMP**
Rohma Rizvi, Sali El-Loh, Siyu Chen, Kai Duan, and Joe F. Lo
University of Michigan, Dearborn, USA

c - Fundamentals in Microfluidics and Nanofluidics
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W4A-407.c **FLOW: A NEW OPEN-ACCESS JOURNAL FOR APPLICATIONS OF FLUID MECHANICS AT ALL LENGTH AND TIME SCALES**
Juan G. Santiago[1] and Carl Meinhart[2]
[1]Stanford University, USA and [2]University of California at Santa Barbara

d - Integrated Microfluidic Platforms
Chemical and Particle Synthesis

M1A-218.d* **INFERENCE OF THE FORMATION PROCESS OF LIPID NANOPARTICLES FROM THE VIEWPOINT OF INTERPARICLE DISTANCE**
Yuka Matsuura[1,2], Masatoshi Maeki[2,3], Takaaki Nishioka[1], Jun Yamauchi[1], Masashi Mizoguchi[1], Koichi Wada[1], and Manabu Tokeshi[2]
[1]Nippon Boehringer Ingelheim Co., Ltd., JAPAN, [2]Hokkaido University, JAPAN, and [3]Japan Science and Technology Agency (JST), JAPAN

M1B-219.d* **DEVELOPMENT OF AN INTEGRATED GLASS-BASED MICROFLUIDIC SYSTEM FOR MASS PRODUCTION OF RNA-LOADED LIPID NANOPARTICLES**
Yuto Okada[1], Masatoshi Maeki[1,2], Yusuke Sato[1], Akihiko Ishida[1], Hirofumi Tani[1], Hideyoshi Harashima[1], and Manabu Tokeshi[1]
[1]Hokkaido University, JAPAN and [2]Japan Science and Technology Agency (JST), JAPAN

M1C-220.d* **GLUCOSE-MONITORING JANUS HYDROGEL MICROBEADS WITH COMPENSATION FUNCTIONS FOR SURROUNDING PH ENVIRONMENT**
Maru Ando[1], Mio Tsuchiya[2], Shun Itai[2], Yun Jung Heo[3], Hiroaki Onoe[2]
[1]Johns Hopkins University, USA, [2]Keio University, JAPAN, and [3]Kyung Hee University, KOREA

W4C-541.d **MONOLITHS AS MICROREACTORS FOR ^{68}GA PROCESSING AND RADIOLABELING**
Ping He[1], Andrew W. Beavis[1,2], Nicole Pamme[1], and Stephen J. Archibald[1,2]
[1]University of Hull, UK and [2]Hull University Teaching Hospitals NHS Trust, UK

W4A-542.d **SYNTHESIS ROUTES FOR NATURALLY FORMED DRUG METABOLITES USING SULT1A1-IMMOBILISED REACTORS**
Bradley Doyle[1], Leigh A. Madden[1], Nicole Pamme[1], and Huw S. Jones[2]
[1]University of Hull, UK and [2]University of Bradford, UK

W4B-543.d **MONODISPERSE POLYHEDRAL OLIGOMERIC SILSESQUIOXANE (POSS) SYNTHESIS IN MICROFLUIDIC ENVIRONMENT**
O. Berkay Şahinoğlu[1], Güneş Kibar[2], and E. Yegân Erdem[1,3]
[1]Bilkent University, TURKEY, [2]Adana Science and Technology University, TURKEY, and [3]UNAM National Nanotechnology Research Centre, TURKEY

d - Integrated Microfluidic Platforms
Electrophoretic and Chromatographic Separation

M1A-221.d **MICROFLUIDIC SIZE EXCLUSION CHROMATOGRAPHY (μSEC) FOR EXTRACELLULAR VESICLES ISOLATION AND PROTEIN SEPARATION**
Sheng Yuan Leong[1], Lingyan Gong[1], Hong Boon Ong[1], Rinkoo Dalan[1,2], and Han Wei Hou[1]
[1]Nanyang Technological University, SINGAPORE and [2]Tan Tock Seng Hospital, SINGAPORE

M1B-222.d* **DNA POINT MUTATION AND PROTEIN ISOFORM CO-DETECTION IN THE SAME CELL: ISOLATION AND ANALYSIS OF SINGLE-CELL DNA**
Alden C. Moss, Ana E. Gomez Martinez, and Amy E. Herr
University of California, Berkeley, USA

M1C-223.d **ON-CHIP RNA PURIFICATION USING ISOTACHOPHORESIS COUPLED WITH POLYACRYLAMIDE GEL ELECTROPHORESIS**
Tori Tonn[1], Crystal Han[2], Duc Tran[2], and Can Cenik[1]
[1]University of Texas, Austin, USA and [2]San Jose State University, USA

T2B-298.d **INTEGRATED ISOTACHOPHORESIS WITH A PROGRAMMABLE MICROFLUIDIC PLATFORM FOR MULTIPLEXED SAMPLE PRECONCENTRATION**
Heritier Adam Shebindu[1], Himali Somawerra[1], Zachary Estlack[2], and Jungkyu Kim[2]
[1]Texas Tech University, USA and [2]University of Utah, USA

T2C-299.d **MICROCHIP ELECTROPHORESIS IN A 3D PRINTED SERPENTINE DEVICE**
Parker R. Nasman, Joule Esene, Gregory P. Nordin, and Adam T. Woolley
Brigham Young University, USA

W4C-544.d A MICROFLUIDIC IN-SITU LIQUID CHROMATOGRAPHY-MASS SPECTROMETRY ANALYSIS PROBE WITH HIGH SEPARATION EFFICIENCY
Shaowen Shi and Qi Lou
Zhejiang University, CHINA

W4A-545.d IMMUNOAFFINITY MONOLITHS FOR MULTIPLEXED BIOMARKER EXTRACTION IN 3D PRINTED MICROFLUIDIC DEVICES
Haifa M. Almughamsi, Karyna M. Howell, Samuel R. Parry, Joule E. Esene, Jacob B. Nielsen, Gregory P. Nordin, and Adam T. Woolley
Brigham Young University, USA

W4B-546.d* A MICROFLUIDIC DEVICE FOR FREE-FLOW COUNTERFLOW GRADIENT FOCUSING
Matthew Courtney, Tomasz Glawdel, and Carolyn Ren
University of Waterloo, CANADA

d - Integrated Microfluidic Platforms
Micromixers and Microreactors

T2A-300.d MORPHING ORIGAMI PHOTO-MICROREACTOR FOR ADAPTIVE PHOTOSYNTHESIS
Yi Pan, Zhenyu Yang, Chang Li, and Ho Chueng Shum
University of Hong Kong, CHINA

T2B-301.d CONTINUOUS PHAGE SELECTION BY INTEGRATED MICROFLUIDIC CHIP
Zong-Han Sie and Ya-Yu Chiang
National Chung-Hsing University, TAIWAN

T2C-302.d A FLEXIBLE PRE-MIXING STICKER FOR EXISTING MICROFLUIDICS
Priscilla Delgado[1,2], Pranav Dorbala[1,2], Abhijit Ravindran[1,2], and David R. Myers[1,2]
[1]Wallace H. Coulter Department of Bioengineering at Emory University and Georgia Tech University, USA and [2]Department of Pediatrics, Aflac Cancer and Blood Disorders Center of Children's Healthcare of Atlanta and Emory University, USA

T3B-410.d ELECTROSTATICALLY EXCITED LIQUID MARBLE AS A MICROMIXER
Nhat-Khuong Nguyen, Pradip Singha, Hongjie An, Kamalalayam Rajan Sreejith, Hoang-Phuong Phan, Nam-Trung Nguyen, and Chin Hong Ooi
Griffith University, AUSTRALIA

W4C-547.d* A DUAL-TARGET MICROFLUIDIC PLATFORM FOR DIAGNOSIS OF RHEUMATOID ARTHRITIS
Tsung-Hsien Wu[1], Yi-Sin Chen[1], Huey-Ling You[2], Mel S. Lee[2], Tien-Tsai Cheng[2], and Gwo-Bin Lee[1]
[1]National Tsing Hua University, TAIWAN and [2]Kaohsiung Chang Gung Memorial Hospital, TAIWAN

W4A-548.d* FLOW PROFILES IN WALL-LESS FLUIDIC DEVICES
M. Florencia Sacarelli[1], Arvind A. Dev[2], Guntars Kitenbergs[3], Bernard Doudin[2], and Thomas M. Hermans[1]
[1]Université de Strasbourg, FRANCE, [2]Institut de Physique et Chimie des Matériaux de Strasbourg, FRANCE, and [3]University of Latvia, LATVIA

W4B-549.d RAPID WARNING MICROANALYSER FOR HEAVY METALS MONITORING IN NATURAL WATERS
Alex Pascual-Esco, Julián Alonso-Chamarro, and Mar Puyol
Universitat Autònoma de Barcelona, SPAIN

W4C-550.d A UNIVERSAL GRADIENT GENERATOR WITH DYNAMIC FLOW CONTROL
Gauri Paduthol, Teji Shenne, Amit Agrawal, and Debjani Paul
Indian Institute of Technology, Bombay, INDIA

W4A-551.d STEREOLITHOGRAPHIC FABRICATION AND CHARACTERIZATION OF IMMOBILIZED ENZYME REACTORS FOR *IN VITRO* DIGESTIONS
Pim de Haan[1,2], Maciej Grajewski[1,3], Daan Zillen[1], and Elisabeth Verpoorte[1]
[1]University of Groningen, NETHERLANDS, [2]TI-COAST, NETHERLANDS, and
[3]SG Papertronics B.V., NETHERLANDS

W4B-552.d CARBONATE CRYSTALLIZATION IN A MICROREACTOR FOR UNDERSTANDING BIOLOGICAL INFLUENCE ON CLUMPED ISOTOPES IN BIOMINERALIZATION
Yanqing Song[1], Javier Medina-Sanchez[2], Andrew Glidle[1], Matthieu Clog[3], Maggie Cusack[2], and Huabing Yin[1]
[1]University of Glasgow, UK, [2]University of Stirling, UK, and
[3]Scottish Universities Environmental Research Centre, UK

d - Integrated Microfluidic Platforms
Particle Separation

M1A-224.d INTEGRATED PLASMONIC NANOAPERTURE ARRAYS AS OPTICAL TRAPS IN MICROFLUIDIC DEVICES
Brigham L. Pope, Mi Zhang, Suhun Jo, J.B. Holmes, Bogdan Dragnea, and Stephen C. Jacobson
Indiana University, USA

M1B-225.d MICROFLUIDIC PARTICLE SORTING SYSTEM INTEGRATED WITH SPHERICALLY-PORED PDMS SPONGES AS SIEVING MATRICES
Runa Hemmi, Takeru Sato, Masumi Yamada, and Minoru Seki
Chiba University, JAPAN

M1C-226.d MICROFLUIDIC PARTICLE SEPARATION USING GLASS STRUCTURES
Tianlong Zhang[1,2], Yaxiaer Yalikun[1], Yigang Shen[3], Dian Anggraini[1], Tao Tang[1], Kazunori Okano[1], Yo Tanaka[3], Ming Li[2], and Yoichiroh Hosokawa[1]
[1]Nara Institute of Science and Technology, JAPAN, [2]Macquarie University, AUSTRALIA, and
[3]RIKEN, JAPAN

M1A-227.d SELECTIVE THERMAL EXTRACTION BY THERMOELECTRIC CONTROLLER MICROFLUIDIC ZINC OXIDE NANOWIRES DEVICE FOR ARTIFICIAL EXTRACELLULAR VESICLE NANOPARTICLES
Kunanon Chattrairat[1], Takao Yasui[1,3], Masatoshi Maeki[3], Manabu Tokeshi[3], and Yoshinobu Baba[1,4]
[1]Nagoya University, JAPAN, [2]Japan Science and Technology Agency (JST), JAPAN,
[3]Hokkaido University, JAPAN, and
[4]National Institutes for Quantum and Radiological Science and Technology, JAPAN

M1B-228.d A MICROFLUIDIC SYSTEM FOR LABEL-FREE AND HIGH-THROUGHPUT MAGNETIC SEPARATION OF NANOPARTICLES
Lin Zeng, Rongrong Zhang, Xi Chen, Shi Hu, Yi Zhang, and Hui Yang
Chinese Academy of Sciences (CAS), CHINA

M1C-229.d A LOW-COST AND EASY TO USE SORTING DEVICE FOR THE SEPARATION OF EXTRACELLULAR VESICLES FROM COMPLEX FLUIDS
Lyne Pillemont[1], Daniel Guneysu[2], Wilfrid Boireau[2], Céline Elie-Caille[2], and Anne-Marie Gué[1]
[1]CNRS LAAS, FRANCE and [2]Université Bourgogne Franche-Comté, FRANCE

M1A-230.d* **ON-CHIP ANALYSIS OF SWINE RESPIRATORY VIRUSES USING MAGNETIC NANOPARTICLE-ENHANCED PHOTONIC CRYSTAL BIOSENSOR**
Qinming Zhang, Gaurav Rawal, Jingjing Qian, Hussam Ibraham, Jianqiang Zhang, Liang Dong, and Meng Lu
Iowa State University, USA

M1B-231.d **SPIRAL INERTIAL MICROFLUIDICS IN THE ISOLATION AND CAPTURE OF SUB-MICRON PARTICLES FOR LIQUID BIOPSY**
Alexandru A. Gheorghiu, Craig Priest, and Melanie MacGregor
University of South Australia, AUSTRALIA

M1C-232.d **CONTINUOUS FLOW DETERMINISTIC iDEP RATCHET DEVICES FOR HIGH-THROUGHPUT ORGANELLE SEPARATION**
Domin Koh[1], Ricardo Ortiz[1], Mohammad Towshif Rabbani[1], Mukul Sonker[1], Cesar A. Velasquez[2], Edgar A. Arriaga[2], and Alexandra Ros[1]
[1]Arizona State University, USA and [2]University of Minnesota, USA

T2A-303.d **INTEGRATION OF DLD MODULES ON A MICROFLUIDIC PLATFORM FOR THE FRACTIONATION OF VIRAL PARTICLES**
Nicolas Sarrut-Rio, Marie Gaillard, François Boizot, Patricia Laurent, Myriam Cubizolles, and Aurélie Thuaire
Université Grenoble Alpes, FRANCE

T2B-304.d **VIRUS REMOVAL FROM SEMEN WITH A PINCHED-FLOW FRACTIONATION MICROFLUIDIC CHIP**
Tanja Hamacher[1], Johanna T.W. Berendsen[1], Jeanne E. van Dongen[1], Regine E. van der Hee[1], Jeroen J.L.M. Cornelissen[1], Marleen L.W.J. Broekhuijse[2,3], and Loes I. Segerink[1]
[1]University of Twente, NETHERLANDS, [2]CRV BV, NETHERLANDS, and [3]Topigs Norsvin, NETHERLANDS

T2C-305.d **TOWARDS THE SEPARATION OF MALARIA INFECTED RED BLOOD CELLS USING LOW-COST MICROFLUIDICS**
Nicolas Thorne[1], Luis Flores-Olazo[1], Julio Valdivia-Silva[1], and Danny van Noort[1,2]
[1]Universidad de Ingenieria y Tecnologia, PERU and [2]Linköping University, SWEDEN

T2A-306.d **ACOUSTIC SEPARATION OF PLATELETS FROM WHOLE BLOOD**
Julia Alsved, Agnes Michanek, and Anke Urbansky
AcouSort AB, SWEDEN

T2B-307.d **MULTI-SIZE SEPARATION OF PARTICLES USING SHEATH-ASSISTED AND SHEATHLESS DIELECTROPHORESIS**
Arash Dalili, Nishat Tasnim, and Mina Hoorfar
University of British Columbia, CANADA

T2C-308.d **SEPARATION OF CLUSTERS OF GROUP A STREPTOCOCCI USING DETERMINISTIC LATERAL DISPLACEMENT**
Elham Akbari, Jason P. Beech, Pontus Nordenfelt, and Jonas Tegenfeldt
Lund University, SWEDEN

T3C-411.d **A FULLY AUTOMATED DISPOSABLE MICROFLUIDIC PLATFORM**
Jinho Kim[1], Hyungseok Cho[1], Junhyeong Kim[1], Joon Seong Park[2], and Ki-Ho Han[1]
[1]Inje University, KOREA and [2]Yonsei University College of Medicine, KOREA

T3A-412.d **PASSIVE, MICROFLUIDIC LOBE FILTRATION**
Andrew S. Clark and Adriana San-Miguel
North Carolina State University, USA

T3B-413.d **2D/3D PARTICLE MANIPULATION BY THERMAL CONVECTION**
Yigang Shen[1,2], Yaxiaer Yalikun[1,3], Tao Tang[3], Nobutoshi Ota[1], and Yo Tanaka[1,2]
[1]RIKEN, JAPAN, [2]Osaka University, JAPAN, and [3]Nara Institute of Science and Technology, JAPAN

T3C-414.d NANOWIRE MICROFLUIDIC DEVICES FOR SPECIFIC CHARGE-BASED ISOLATION OF SMALL EXTRACELLULAR VESICLES
Piyawan Paisrisarn[1], Takao Yasui[1,2], and Yoshinobu Baba[1,3]
[1]Nagoya University, JAPAN, [2]Japan Science and Technology Agency (JST), JAPAN, and [3]National Institutes for Quantum and Radiological Science and Technology, JAPAN

T3A-415.d BIOMANUFACTURING SCALE CHO CELL CLARIFICATION USING HARD PLASTIC SPIRAL INERTIAL MICROFLUIDIC DEVICE
Hyungkook Jeon, Taehong Kwon, Junghyo Yoon, and Jongyoon Han
Massachusetts Institute of Technology, USA

T3B-416.d A TRANSPARENT FACE MASK WITH MICROCHANNEL AGAINST VIRUS VIA AEROSOL
Neethish Kumar Unnam[1], Lung-Jieh Yang[1], Vivek Jabaraj Joseph[1], and Pei-Zen Chang[2]
[1]Tamkang University, TAIWAN and [2]National Taiwan University, TAIWAN

T3C-417.d DESIGN AND CHARACTERIZATION OF AN INERTIAL MICROFLUIDIC CHANNEL TO ENHANCE THE PROCESS OF CAR-T CELL THERAPY
Sajad Razavi Bazaz and Majid Ebrahimi Warkiani
University of Technology Sydney, AUSTRALIA

T3A-418.d ON-CHIP MULTI-SORTING SYSTEM UTILIZING DUAL MEMBRANE PUMPS DRIVEN BY PIEZOELECTRIC ACTUATORS
Shota Iwakawa[1], Makoto Saito[2], Yoko Yamanishi[1], Fumihito Arai[3], and Shinya Sakuma[1]
[1]Kyushu University, JAPAN, [2]Nagoya University, JAPAN, and [3]University of Tokyo, JAPAN

W4C-553.d SIZE-BASED MICROPARTICLE SEPERATION USING NEGATIVE MAGNETOPHORESIS
Ozge Solmaz Ozcelik[1], Cemre Oksuz[1], and H. Cumhur Tekin[1,2]
[1]Izmir Institute of Technology, TURKEY and [2]Middle East Technical University, TURKEY

d - Integrated Microfluidic Platforms
Other Applications in Chemistry

M1A-233.d RAPID MASS SPECTROMETRIC CALIBRATION AND STANDARD ADDITION USING HYDROPHOBIC/HYDROPHILIC PATTERNED SURFACES AND DISCONTINUOUS DEWETTING
Matthias Hermann, Prashant Agrawal, and Richard D. Oleschuk
Queen's University, CANADA

W4A-554.d DIFFUSION THROUGH SINGLE POROUS PARTICLES STUDIED IN A MICROFLUIDIC SYSTEM
Luca Carnevale[1], Rafael M. Gonzalez[2], Florian Meirer[2], Wouter Olthuis[1], Bert M. Weckhuysen[2], and Albert van den Berg[1]
[1]University of Twente, NETHERLANDS and [2]Utrecht University, NETHERLANDS

e - Micro- and Nanoengineering
Bonding, Sealing and Interfacing Technologies

M1B-234.e A REUSABLE GLASS MICROFLUIDIC DEVICE FOR CELL RECOVERY BY USING REVERSIBLE GLASS–GLASS BONDING
Nobutoshi Ota, Shun-ichi Funano, and Yo Tanaka
RIKEN, JAPAN

M1C-235.e* **A ROBUST PROGRAMMABLE MICROFLUIDIC PLATFORM FOR LONG-TERM SPACE EXPLORATION**
Zachary Estlack[1], Matin Golozar[2], Anna Butterworth[2], Jeremy McCauley[2], Richard A. Mathies[2], and Jungkyu Kim[1]
[1]University of Utah, USA and [2]University of California, Berkeley, USA

T2A-309.e **COVALENT BONDING OF 3D MICROSTRUCTURES WITHIN THERMOPLASTIC MICROCHANNELS VIA *IN SITU* PHOTOGRAFTING**
Jung Y. Han, Sarah Warshawsky, and Don L. DeVoe
University of Maryland, USA

T2B-310.e **INTEGRATION OF PDMS MICROFLUIDIC CHANNELS WITH ELECTRONIC SYSTEMS USING SIO_2 MEDIATED BONDING OF PDMS AND POLYIMIDE**
Adwait Deshpande, Mohit U. Karkhanis, Aishwaryadev Banerjee, Chayanjit Ghosh, Erfan Pourshaban, Hanseup Kim, and Carlos H. Mastrangelo
University of Utah, USA

T2C-311.e **HIGH-STRENGTH ADHESIVE BONDING OF 3D PRINTED MICROFLUIDIC DEVICES TO PDMS**
Brady Goenner and Bruce Kent Gale
University of Utah, USA

T3B-419.e **DIRECT INTERFACIAL BONDING OF THERMOPLASTIC MICROFLUIDIC DEVICE BY WATER**
Chia-Wen Tsao and Chang-Yen Chang
National Central University, TAIWAN

T3C-420.e **SEQUENTIAL ACTIVATION OF ARRAYED ENZYME ELECTRODE SENSORS FOR LONG-TERM GLUCOSE MONITORING.**
Takeshi Miyazawa, Jun Sawayama, Yuya Morimoto, and Shoji Takeuchi
University of Tokyo, JAPAN

e - Micro- and Nanoengineering
Micropumps, Valves, and Dispensers

M1A-236.e **BIO-ACTUATED MICROVALVE IN MICROFLUIDICS BY SENSING AND ACTUATING FUNCTION OF *MIMOSA PUDICA***
Yusufu Aishan[1,2], Shun-ichi Funano[1], Asako Sato[1], Yuri Ito[1], Nobutoshi Ota[1], Yaxiaer Yalikun[1,3], and Yo Tanaka[1,2]
[1]RIKEN, JAPAN, [2]Osaka University, JAPAN, and [3]Nara Institute of Science and Technology, JAPAN

M1B-237.e* **SELF-OSCILLATING POLYMER GEL ACTUATED CHEMICAL MICROPUMP WITH THERMAL SENSITIVITY**
Yusufu Aishan[1,2], Yaxiaer Yalikun[1,3], Yigang Shen[1,2], Yapeng Yuan[1,2], Satoshi Amaya[1], Takashi Okutaki[4], Atsuhito Osaki[4], Shingo Maeda[4], and Yo Tanaka[1,2]
[1]RIKEN, JAPAN, [2]Osaka University, JAPAN, [3]Nara Institute of Science and Technology, JAPAN, and [4]Shibaura Institute of Technology, JAPAN

M1C-238.e* **MICROSCALE IMPELLER PUMP FOR RECIRCULATING FLOW IN ORGANS-ON-CHIP AND MICROREACTORS**
Sophie R. Cook[1], Hannah B. Musgrove[1], Amy L. Throckmorton[2], and Rebecca R. Pompano[1]
[1]University of Virginia, USA and [2]Drexel University, USA

M1A-239.e **TWO-DIMENTIONAL MICROAPERTURE ARRAY FOR ON-DEMAND FORMATION OF HETEROGENEOUS GEL FIBERS**
Koki Takahashi, Hidekuni Takao, Fusao Shimokawa, and Kyohei Terao
Kagawa University, JAPAN

M1B-240.e ACOUSTICALLY-DRIVEN SHARP-EDGE MICROPUMP CAPABLE OF CELL FOCUSING AND FLUID MIXING
Alen Pavlic[1], Cooper L. Harshbarger[1,2], Luca Rosenthaler[1], and Jürg Dual[1]
[1]Swiss Federal Institute of Technology Zurich, SWITZERLAND and [2]University of Zurich, SWITZERLAND

M1C-241.e CULTURE DISH MOUNTABLE CENTRIFUGAL PUMP DRIVEN BY MAGNETIC FORCE IN APPLICATIONS FOR TISSUE ENGINEERING
Byeongwook Jo, Yuya Morimoto, and Shoji Takeuchi
University of Tokyo, JAPAN

M1A-242.e* DEFORMABLE 3D-PRINTED SOFT MICROFLUIDIC DEVICES
Haruka Futatsubashi, Yuya Morimoto, and Shoji Takeuchi
University of Tokyo, JAPAN

T2A-312.e DYNAMIC BEHAVIOR OF PASSIVE MICROVALVES IN MICROPUMPS FOR MEDICAL APPLICATIONS
Lorenz Gruenerbel[1,2], Barbara Leikam[3], and Gabriele Schrag[2]
[1]Fraunhofer EMFT, GERMANY, [2]Technical University Munich, GERMANY, and
[3]Vienna University of Technology, AUSTRIA

T2B-313.e A SELF-STERILIZING, TOUCH-ACTIVATED MICROSURFACE FOR PREVENTING HOSPITAL ACQUIRED INFECTIONS
Georgia Korompili[1,2], George Vekinis[1], and Nikos Chronis[1,2]
[1]Institute of Nanoscience and Nanotechnology, GREECE and [2]University of Crete, GREECE

T2C-314.e AN ULTRA-LOW-COST POWER-FREE PORTABLE MICROFLUIDICS SYRINGE PUMP
Apresio K. Fajrial, Adam Vega, Gazendra Shakya, and Xiaoyun Ding
University of Colorado, Boulder, USA

T3A-421.e REDUCING SHEAR EFFECTS ON BETA CELLS DRIVEN BY µTESLA PUMP
Kai Duan, Sali El-loh, and Joe Lo
University of Michigan, Dearborn, USA

T3B-422.e 3D PRINTED MICROFLUIDIC 1-WAY VALVES AND PUMPS
Hunter Hinnen, Matthew Viglione, Adam T. Woolley, and Gregory P. Nordin
Brigham Young University, USA

T3C-423.e FABRICATION OF THERMO-RESPONSIVE VALVES FOR µPADS USING POLY(N-ISOPROPYLACRYLAMIDE)
Hiroki Toda[1,2], Wataru Iwasaki[2], Nobutomo Morita[2], Taisei Motomoura[2], Yoshitaka Nakanishi[1], and Yuta Nakashima[1]
[1]Kumamoto University, JAPAN and
[2]National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

T3A-424.e ACCURATE MEASUREMENT OF DRUG UPTAKE TIME OF CANCER CELLS
Francesco Nalin, Marta Pilz, Karina Kwapiszewska, Ladislav Derzsi, Karol Makuch, Piotr Garstecki, and Robert Holyst
Polish Academy of Sciences, POLAND

W4B-555.e MODULAR MICROPUMPS FABRICATED BY 3D PRINTED TECHNOLOGIES
Yara Alvarez-Braña[1], Fernando Benito-Lopez[1,2,3] and Lourdes Basabe-Desmonts[1,2,3,4]
[1]University of the Basque Country, SPAIN, [2]Bioaraba Health Research Institute, SPAIN,
[3]BCMaterials, SPAIN, and [4]IKERBASQUE, SPAIN

W4C-556.e AUTOMATED MEDIUM RECIRCULATION USING MACRO VALVES FOR HIGH FLOW RATES IN AN ENDOTHELIAL CELL CULTURE CHIP
Elsbeth G.B.M. Bossink, Anke R. Vollertsen, Loes I. Segerink, Andries D. van der Meer, Mathieu Odijk
University of Twente, NETHERLANDS

e - Micro- and Nanoengineering
Microscale Fabrication, Patterning, and Integration

M1B-243.e STUDY ON WOUND HEALING PROMOTED BY PLASMA BASED ON MICRO ENERGETIC DEVICES
Yi Sun, Wen Zhong Lou, Bo He, Yue Cen Zhao, and Heng Zhen Feng
Beijing Institute of Technology, CHINA

M1C-244.e REMOVAL OF BUBBLES UTILIZING A MEMBRANE-BASED DEBUBBLER
Weidong Zhou, Ruige Wu, Wei Hua, Jiamin Zeng, and Wei Wang
Singapore Institute of Manufacturing Technology (SIMTech), SINGAPORE

M1A-245.e* INTEGRATED 3D PRINTED ISOPOROUS MEMBRANES WITH 7µM PORES
Matthew S. Viglione, Dallin S. Miner, Kenneth A. Christensen, Adam T. Woolley, and Gregory P. Nordin
Brigham Young University, USA

M1B-246.e* SKELETAL MUSCLE TISSUE CONSTRUCTION WITHOUT NON-EDIBLE EXTRACELLULAR MATRIX
Kenta Horiuchi, Byeongwook Jo, Yuya Morimoto, and Shoji Takeuchi
University of Tokyo, JAPAN

M1C-247.e DIRECTIONAL CONTROL OF ELECTRONIC COMPONENTS BY PATTERN COMPLEMENTARITYIN THE SELF-ASSEMBLING SYSTEM
Kaito Nakayama, Tatsuya Hikida, and Hiroaki Suzuki
Chuo University, JAPAN

M1A-248.e PATTERNING OF NEUROBLASTOMA CELLS INSIDE A GRADIENT-GENERATING MICROFLUIDIC DEVICE
Piunti Caterina[1,2], Sara Micheli[1,2], and Elisa Cimetta[1,2]
[1]University of Padua, ITALY and [2]Fondazione Istituto di Ricerca Pediatrica Città della Speranza, ITALY

M1B-249.e* SPONTANEOUS WETTING ARRAYS OF SURFACE ENERGY TRAPS FOR DROPLET SPLITTING, PRECONCENTRATION AND TISSUE PROFILING
Phillip Hillen, Rory McEwan, and Richard Oleschuk
Queen's University, CANADA

M1C-250.e PATTERNED HIERARCHICAL OMNIPHOBIC STRUCTURES FOR ANTI-FOULING AND BIOSENSING APPLICATIONS
Sara M. Imani, Roderick Maclachlan, Yuting Chan, Amid Shakeri, Leyla Soleymani, and Tohid F. Didar
McMaster University, CANADA

M1A-251.e DEVELOPMENT AND CHARACTERIZATION OF LAB-MADE ELECTRODES FOR ELETROCHEMICAL DETECTION IN A 3D-PRINTED MICROCHIP ELECTROPHORETIC DEVICE
Brenda M. de C. Costa[1,2], Sophie Griveau[1], Fanny D'Orlyé[1], Fethi Bedioui[1], Anne Varenne[1], and José A. Fracassi da Silva[2]
[1]Chimie ParisTech-PSL, FRANCE and [2] State University of Campinas, BRAZIL

M1B-252.e* **A SILICON µDICER FOR UNIFORM MICRODISSECTION OF TISSUES**
Seth C. Cordts, Nicolas Castaño, Saisneha Koppaka, and Sindy K.Y. Tang
Stanford University, USA

M1C-253.e **TOWARDS PERSONALIZED THROMBOSIS STUDIES: *IN SITU* MOLD-FREE LITHOGRAPHY OF PHYSIOLOGICAL STENOSIS IN CIRCULAR CAPILLARIES**
Yean J. Lim, Yongxiao Li, Elizabeth E. Gardiner, and Woei M. Lee
Australian National University, AUSTRALIA

M1A-254.e **MOLD-FREE FABRICATION OF HETEROGENEOUS HYDROGEL MICROSTRUCTURES USING A STEREOLITHOGRAPHIC BIOPRINTER**
Haruka Oda, Minghao Nie, and Shoji Takeuchi
University of Tokyo, JAPAN

M1B-255.e **FABRICATION OF FREESTANDING MULTICELLULAR DISCS USING THERMO-RESPONSIVE HYDROGELS**
Xiaolei Nie[1], Terry Ching[1,2], and Michinao Hashimoto[1]
[1]Singapore University of Technology and Design, SINGAPORE and
[2]National University of Singapore, SINGAPORE

M1C-256.e **SILVER NANOWRIE MICROPATTERNING OF VARIOUS CONCENTRATIONS USING MASKLESS LITHOGRAPHY**
Hyeli Kim and Wook Park
Kyung Hee University, KOREA

M1A-257.e **FABRICATION OF PUF MICROPARTICLES USING ARTIFICIAL MARBLE PATTERNS**
Jae In Lee and Wook Park
Kyung Hee University, KOREA

M1B-258.e* **SELECTIVE PATTERNING OF BIOLOGICAL MEMBRANES IN SUSPENDED MICROCHANNELS TOWARDS THE NEXT GENERATION OF TISSUE BARRIERS-ON-CHIPS.**
Sofia Madrigal Gamboa, Jung Seub Lee, and Noo Li Jeon
Seoul National University, KOREA

M1C-259.e **CONTROLLING THE CRACK PATTERNS ONTO THE SILICA-COATED MICROPARTICLES FOR PHYSICAL UNCLONABLE FUNCTIONS (PUFS)**
Minhyuk Lee, CheolHeon Park, and Wook Park
Kyung Hee University, KOREA

M1A-260.e* **RECONSTRUCTION OF 3D VASCULARIZED TUMOR MICROENVIRONMENT AND DRUG SCREENING IN MESH-STRUCTURED MICROFLUIDIC PLATFORM**
Sangmin Jung, Jungseub Lee, and Noo Li Jeon
Seoul National University, KOREA

M1B-261.e **DIRECT INK WRITING (DIW) 3D PRINTING FOR FABRICATING FLEXIBLE MICROFLUIDIC DEVICES**
Kento Yamagishi[1], Terry Ching[1,2], Rahul Karyappa[1], Nicole Chien[1], Martin Tan[1], Yi-Chin Toh[3], Shaoying Huang[1], and Michinao Hashimoto[1]
[1]Singapore University of Technology and Design, SINGAPORE,
[2]National University of Singapore, SINGAPORE, and [3]Queensland University of Technology, AUSTRALIA

T2A-315.e **A NOVEL MULTIFUNCTIONAL FULLY-PRINTED PIEZOELECTRIC FLEXIBLE DEVICE USED AS SENSOR, ACTUATOR AND ENERGY HARVESTER**
Marc Alique[1], Ana Moya[1], David Otero[1], Marcos Duque[2], Paul Lacharmoise[1], Gonzalo Murillo[2], and Claudia Delgado[1]
[1]Eurecat, Centre Tecnològic de Catalunya, SPAIN and
[2]Instituto de Microelectrónica de Barcelona (IMB-CNM (CSIC)), SPAIN

T2B-316.e RAPID FABRICATION OF SPHERICAL MICROWELLS USING A THERMALLY REFLOWED HETEROGENEOUS MOLD
Zhiyuan Dong, Bangyong Sun, Xue Han, Qiang Zhao, and Gang Li
Chongqing University, CHINA

T2C-317.e CONFINEMENT-BASED INTEGRATION OF SIDEWALL ELECTRODES IN MICROCHANNELS FOR ELECTROCHEMICAL AND IMPEDANCE SENSING
XuHai Huang, Ahmed Rasin, Steven Tate, Karina Torres-Castro, Walter Varhue, and Nathan S. Swami
University of Virginia, USA

T2A-318.e AN INERTIALESS FLOW PROFILE ENGINEERING METHOD FOR COMPLEX-SHAPED FLOWS
Zhenyu Yang, Lang Nan, and Ho Cheung Shum
University of Hong Kong, HONG KONG

T2B-319.e GROWTH OF TUNABLE FRACTAL NANOSTRUCTURES AND ANALYTE CAPTURE FOR SURFACE-ENHANCED RAMAN SCATTERING VIA AN ELECTRIC FIELD-GUIDED METHOD
Shamim Azimi and Aristides Docoslis
Queen's University, CANADA

T2C-320.e A PRECISE SURFACE PATTERNING STRATEGY FOR WETTING-ENABLED LIQUID TRAPPING
Lishen Zhang, Timothy T. Salomons, and Richard Oleschuk
Queen's University, CANADA

T2A-321.e ELECTROFABRICATED CHITOSAN MEMBRANE ARRAYS AND THEIR PHYSICOCHEMICAL PROPERTIES IN MICROFLUIDICS
Loan Khanh Ly, Piao Hu, Phu Pham, Van Lam, Christopher B. Raub, and Xiaolong Luo
Catholic University of America, USA

T2B-322.e 3D NANOPRINTED MICROINJECTION NEEDLES *VIA EX SITU* DIRECT LASER WRITING
Ziteng Wen[1], Ruben Acevedo[1], Kinneret Rand-Yadin[2], and Ryan Sochol[1]
[1]University of Maryland, USA and [2]SeeTrue Technology, LLC, USA

T2C-323.e 3D PRINTING MICROFLUIDIC DEVICES WITH CLEAR RESIN FOR ELECTROPHORETIC SEPARATION
Jacob B. Nielsen, Mawla Boaks, Anna V. Bickham, Gregory P. Nordin, and Adam T. Woolley
Brigham Young University, USA

T2A-324.e FABRICATION OF STABLE GRADIENTS IN A HYDROGEL-FILLED MICROFLUIDIC DEVICE
Gabriela Lomeli[1] and Amy E. Herr[1,2]
[1]University of California, Berkeley, USA and [2]Chan Zuckerberg Biohub, USA

T2B-325.e FLUORESCENCE-BASED DETECTION OF CYTOKINES USING BIOFUNCTIONAL LUBRICANT-INFUSED SURFACES
Amid Shakeri and Tohid F. Didar
McMaster University, CANADA

T2C-326.e ULTRA-SENSITIVE WEARABLE BLOOD PRESSURE SENSOR BASED ON HIGHLY MICROSTRUCTURED ELECTRODES AND IONTRONIC DIELECTRIC
Chengyang Qian, Joshua Kim, Lancy Lin, Yongxiao Zhou, and Michelle Khine
University of California, Irvine, USA

T2A-327.e SIMPLE SINGLE-CELL TRACKING WITH ENCODED ENCAPSULATION
Ratul Paul, Yuyuan Zhou, and Yaling Liu
Lehigh University, USA

T2B-328.e LONG-TERM STABLE AND MICRO-SIZED ON-CHIP REFERENCE ELECTRODE WITH BIOCOMPATIBLE COATING
Dongwon Lee, Doohwan Jung, Adam Wang, and Hua Wang
Georgia Institute of Technology, USA

T2C-329.e PAIRING APPROPRIATE PAPER MEMBRANES TO ENHANCE THE PERFORMANCE OF MICROFLUIDIC PAPER ANALYTICAL DEVICES (µPADS)
Mohet Mittal and Bhushan J. Toley
Indian Institute of Science, Bangalore, INDIA

T2A-330.e SCALABLE REAGENT INTEGRATION WITH CONTROLLED RELEASE IN A THERMOPLASTIC MICROWELL ARRAY
Jaesung Lee and Don L. DeVoe
University of Maryland, USA

T3B-425.e CONFINEMENT OF MICRODROPLET ON NANOSTRUCTURED SILICON SUBSTRATE FOR SURFACE-ENHANCED RAMAN SPECTROSCOPY
You-Shan Zheng and Chia-Wen Tsao
National Central University, TAIWAN

T3C-426.e LASER ENGRAVED GROOVES FOR MICROPARTICLE FOCUSING
Tianlong Zhang[1,2], Yaxiaer Yalikun[1], Ryota Kiya[1], Hanaka Uno[1], Kazunori Okano[1], Yo Tanaka[3], Ming Li[2], and Yoichiroh Hosokawa[1]
[1]Nara Institute of Science and Technology, JAPAN, [2]Macquarie University, AUSTRALIA, and [3]RIKEN, JAPAN

T3A-427.e BARRIER-FREE PAPER ANALYTICAL DEVICES FOR MULTIPLEX COLORIMETRIC DETECTION
Ayushi Chauhan and Bhushan J. Toley
Indian Institute of Science, Bengaluru, INDIA

T3B-428.e MOLD GEOMETRY-MEDIATED FABRICATION OF POLYMERIC MICROPARTICLES BY TUNING MOLD SWELLING AND CAPILLARITY
Reya Ganguly[1], Yoon Choi[2], Chang-Hyung Choi[2], and Chang-Soo Lee[1]
[1]Chungnam National University, KOREA and [2]Daegu Haany University, KOREA

T3C-429.e SUSTAINABLE MICRO VACCINE CARRIERS FABRICATED BY MICRO-ELECTROSPRAYING AND SURFACE CROSS-LINKING
Chih-Hsuan Lien, Guan-Hung Chen, Hsin-Yu Yang, and Fan-Gang Tseng
National Tsing Hua University, TAIWAN

T3A-430.e SELF-ASSEMBLY HYDROGEL SCAFFOLDS 3D-PRINTED FOR CARTILAGE REPAIRATION
Chuan Yung Wu[1], Yun Jie Hao[1], Fan Gang Tseng[1], and Yu Chuan Su[1,2]
[1]National Tsing Hua University, TAIWAN and [2]Academia Sinica, TAIWAN

T3B-431.e MICROFABRICATED STAINLESS STEEL MULTIELECTRODE NEURAL PROBE WITH BATCH FABRICATION
Xiaoyi Shi, Junshi Li, Dong Huang, and Zhihong Li
Peking University, CHINA

T3C-432.e BIOMECHANICAL MODULATION OF CALCIUM EVENT RATES IN SOFT MATTER NEURO PATTERNS
Connor Beck, Hammad Khan, and Anja Kunze
Montana State University, USA

T3A-433.e **THE REST OF THE STORY: HIGH RESOLUTION 3D PRINTING WITH A BIOCOMPATIBLE RESIN FOR MICROFLUIDICS**
Mawla Boaks, Nicholas A. Chartrand, Matthew S. Viglione, Adam T. Woolley, Kenneth A. Christensen, and Gregory P. Nordin
Brigham Young University, USA

T3B-434.e **3D DEFORMATION OF THERMORESPONSIVE GEL ACTUATOR UNDER MECHANICAL CONSTRAINTS**
Hiroki Wada[1], Yuha Koike[1], Yoshiyuki Yokoyama[2], and Takeshi Hayakawa[1]
[1]Chuo University, JAPAN and [2]Toyama Industrial Technology Research and Development Center, JAPAN

T3C-435.e **A MICROFLUIDIC SLIPCHIP FOR LABEL-FREE *E. COLI* DETECTION BASED ON β-D-GLUCURONIDASE ASSAY**
Gaozhe Cai[1,3], Cong Ma[1,2,3], Yaru Huang[1,3,4], Yuhang Huang[1,3,4], Haoran Hu[1,3,5], Jianlong Zhao[1,3], and Shilun Feng[1,3]
[1]Chinese Academy of Sciences (CAS), CHINA, [2]ShanghaiTech University, CHINA, [3]University of Chinese Academy of Sciences, CHINA, [4]Shanghai Normal University, CHINA, and [5]Wenzhou Medical University, CHINA

T3A-436.e **PHOTOPATTERNING AND TUNING CELL ADHESIVE MOIETIES IN PEG HYDROGEL BY CONTROLLING MOIETIES AVAILABILITY AT HYDROGEL INTERFACE**
Jing Liu, Cassidy Enloe, Alan Stenquist, Katie D. Li-Oakey, and John Oakey
University of Wyoming, USA

T3B-437.e **3D PRINTED, HIGH THROUGHPUT AND EASY-TO-PATTERN OPEN MICROFLUIDIC PLATFORM TO MIMIC *IN VITRO* THE 3D ARCHITECTURE OF THE LUNG ALVEOLI**
Tri Tho Yves Nguyen, Jungseub Lee, and Noo Li Jeon
Seoul National University, KOREA

T3C-438.e **ON CHIP SPERM PENETRATION ASSAY (SPA) FOR HIGH PENATAION FOR HIGH PENETRATION RATE SPERM SCREENING**
I-Jui Chen[1], Suei-Shen Wang[1], Jen kuei Wu[1], and Fan-Gang Tseng[1,2]
[1]National Tsing Hua University, TAIWAN and [2]Academia Sinica, TAIWAN

T3A-439.e **3D-PRINTED SKIN-INTERFACED MICROFLUIDIC SYSTEMS FOR SWEAT CAPTURE AND ANALYSIS**
Chung-Han Wu and Tyler Ray
University of Hawai'i, Mānoa, USA

W4A-557.e* **PATTERNED MICROCARRIERS FOR PROTECTION AND PROFILING OF ADHERENT CELLS**
Shreya Udani[1], Ghulam Destgeer[2], Kelly O'Connor[1], and Dino Di Carlo[1]
[1]University of California, Los Angeles, USA and [2]Technical University of Munich, GERMANY

W4B-558.e* **CRYOPRESERVATION OF 3D TUMOR MODELS IN A PAPER PLATFORM**
Bisan Samara[1], Muhammedin Deliorman[1], Pavithra Sukumar[1], and Mohammad A. Qasaimeh[1,2]
[1]New York University, Abu Dhabi, UAE and [2]New York University, USA

W4C-559.e **3D IN-PLANE INTEGRATED REFLECTORS FOR LAB ON A CHIP APPLICATIONS**
Filippo Storti[1,2], Silvio Bonfadini[1], and Luigino Criante[1]
[1]Istituto Italiano di Tecnologia, ITALY and [2]Politecnico di Milano, ITALY

W4A-560.e **PLANAR HYDRODYNAMIC TRAPS CONNECTED TO BURIED CHANNELS FOR BEADS AND CELLS TRAPPING AND RELEASING**
Clémentine Lipp, Kevin Uning, Jonathan Cottet, Arnaud Bertsch, and Philippe Renaud
Ecole Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

W4B-561.e 3D PRINTED INLAYS FOR INJECTION MOULDED MICROFLUIDICS
Neil Convery[1], Gareth J. Sullivan[2], and Nikolaj Gadegaard[1]
[1]University of Glasgow, UK and [2]University of Oslo, NORWAY

W4C-562.e LOCAL DEPOSITION OF NANOPARTICLES ON A PDMS MICROFLUIDIC DEVICE
Alessia Broccoli[1], Anke R. Vollertsen[1], Pauline Roels[2], Aaike van Vugt[2], Albert van den Berg[1], and Mathieu Odijk[1]
[1]University of Twente, NETHERLANDS and [2]VSPARTICLE B.V., NETHERLANDS

W4A-563.e RESEARCH ON THE FABRICATION OF HIGHLY TRANSPARENT PLASTIC MICROSTRUCTURES WITH MULTI-STAGE STRUCTURES
Mitsuhiro Horade, Kei Yamada, Tasuku Yamawaki, and Masahito Yashima
National Defense Academy of Japan, JAPAN

W4B-564.e MULTIPLEXED ORGAN-ON-CHIPS WITH INTEGRATED MACRO VALVES FOR AUTOMATED CELL CULTURE
Elsbeth G.B.M. Bossink, Anke R. Vollertsen, Lieke P. Hagen, Andries D. van der Meer, Loes I. Segerink, and Mathieu Odijk
University of Twente, NETHERLANDS

W4C-565.e DIRECT ELECTROSPINNING ON MICROCHANNELS: NANOFIBERS AS POTENTIAL REPLACEMENTS FOR BULK PDMS MEMBRANES
Afraz Khan[1], Hiroaki Takehara[1,2], and Takanori Ichiki[1,2]
[1]University of Tokyo, JAPAN and [2]Innovation Center of NanoMedicine (iCONM), JAPAN

W4A-566.e MICROFABRICATION OF DOMESTICATION PODS FOR *IN-SITU* CULTIVATION OF MARINE BACTERIA USING TWO-PHOTON POLYMERIZATION TECHNOLOGY
Sydney K. Wheatley[1], Christopher Cartmell[1], Bradley A. Haltli[1,2], Russell G. Kerr[1,2], and Ali Ahmadi[1]
[1]University of Prince Edward Island, CANADA and [2]Nautilus Biosciences, CANADA

W4B-567.e* VERTICALLY INTEGRATED MICROFLUIDIC STRUCTURES ON MICRO ELECTRODE ARRAY FOR IN VITRO NEURAL CIRCUITRY MODELING
Tianshuo Wang[1], Wei-Kai Huang[2], Ziyuan Guo[2], and Tao Li[1]
[1]University of Cincinnati, USA and [2]Cincinnati Children's Hospital Medical Center, USA

W4C-568.e BIOABSORBABLE MICRONEEDLE WITH HIGH ASPECT RATIO FOR PAINLESS INSERTION WITHOUT DEFORMATION
Yukihiro Kanda[1], Hiroaki Takehara[1,2], and Takanori Ichiki[1,2]
[1]University of Tokyo, JAPAN and [2]Innovation Center of NanoMedicine (iCONM), JAPAN

e - Micro- and Nanoengineering
Nanoscale Fabrication, Patterning, and Integration

M1C-262.e INTRODUCTION OF A HIGH QUALITY NANOFILM OF ALUMINUM OXIDE ENHANCES THE PERFORMANCE OF EWOD MICROFLUIDIC PLATFORMS
Adriana A. Karcz[1,2], David Schaubroeck[1], Rik Verplancke[1], Ann Van Soom[2], and Jan Vanfleteren[1]
[1]IMEC and Ghent University, BELGIUM and [2]Ghent University, BELGIUM

T2B-331.e ANTIBODY PARTIAL MODIFICATION METHODS FOR MULTIPLEX IMMUNOASSAY BY MICRO/NANOFLUIDIC PRINTING AND DETACHABLE SUBSTRATE BONDING
Yoshiyuki Tsuyama, Keisuke Shinoda, and Kazuma Mawatari
University of Tokyo, JAPAN

T3B-440.e FABRICATION OF A NANOSCALE CURVED STRUCTURE AND APPLICATION TO NANOCHANNEL OPEN/CLOSE VALVE
Hiroki Sano[1], Yutaka Kazoe[2], Kyojiro Morikawa[1], and Takehiko Kitamori[1,3]
[1]University of Tokyo, JAPAN, [2]Keio University, JAPAN, and [3]National Tsing Hua University, TAIWAN

T3C-441.e GLASS MICROFLUIDIC PLATFORM FOR NANOWIRE-ASSISTED URINARY CELL-FREE DNA ISOLATION
Hiromi Takahashi[1], Takao Yasui[1,2], Keiko Shinjo[1], Yusuke Miyazaki[1], Wataru Shinoda[1], Takeshi Hasegawa[3], Yotaro Kitano[1], and Yoshinobu Baba[1,2,4]
[1]Nagoya University, JAPAN, [2]Japan Science and Technology Agency (JST), JAPAN, [3]Kyoto University, JAPAN, and [4]National Institutes for Quantum and Radiological Science and Technology, JAPAN

T3A-442.e DRAG REDUCTION IN NANOFLUIDIC CHANNELS BY INTEGRATION OF NANOPILLARS WITH CONTROLLED DIMENSION AND GEOMETRY
Kensuke Mino and Yutaka Kazoe
Keio University, JAPAN

T3B-443.e MICRO- AND NANOFLUIDIC CONTROL WITH PARTIAL INTEGRATION OF PDMS VALVE INTO GLASS NANOFLUIDIC DEVICE
Kyojiro Morikawa[1], Shu Matsuura[1], Hiroki Sano[1], Yutaka Kazoe[2], and Takehiko Kitamori[1,3]
[1]University of Tokyo, JAPAN, [2]Keio University, JAPAN, and [3]National Tsing Hua University, TAIWAN

T3C-444.e ANTIBODY PATTERNING IN NANOCHANNELS WITH UNIFORMITY AND HIGH DENSITY
Ryoichi Ohta[1], Yota Matsumoto[1], Yuji Itoh[2], and Takehiko Kitamori[3]
[1]University of Tokyo, JAPAN, [2]Kagoshima University, JAPAN, and [3]National Tsing-Hua University, TAIWAN

T3A-445.e CELL DEBRIS FILTERING AND LIQUID EXCHANGE USING NANOFLUDIC DEVICE FOR PRETREATMENT OF SINGLE CELL LYSATE SAMPLE
Kyojiro Morikawa[1], Shu Matsuura[1], Yutaka Kazoe[2], Ayumi Yoshizaki[3], and Takehiko Kitamori[1,4]
[1]University of Tokyo, JAPAN, [2]Keio University, JAPAN, [3]University of Tokyo Hospital, JAPAN, and [4]National Tsing Hua University, TAIWAN

W4A-569.e ADVANCED 3D PRINTED PROBES FOR ATOMIC FORCE MICROSCOPY
Ayoub Glia[1,2], Muhammedin Deliorman[1], and Mohammad A. Qasaimeh[1,2]
[1]New York University, Abu Dhabi, UAE and [2]New York University, USA

e - Micro- and Nanoengineering
New Materials and Surface Modification

M1A-263.e DEVELOPMENT OF MICROCHANNEL IMMUNOASSAY DEVICE APPLYING THE TRANSPARENCY OF CELLULOSE-DERIVED MATERIALS
Jungchan Shin, Toshihiro Kasama, and Ryo Miyake
University of Tokyo, JAPAN

M1B-264.e A HYDROGEL MICRONEEDLE-BASED BIOSENSOR FOR CONTINUOUS, REAL-TIME, AND ENZYME-LESS GLUCOSE MEASUREMENT
Peyman GhavamiNejad[1], Karan Dhingra[1], Amin GhavamiNejad[2], and Mahla Poudineh[1]
[1]University of Waterloo, CANADA and [2]University of Toronto, CANADA

T2C-332.e TOWARDS EXTRACELLULAR VESICLE-FRIENDLY MICROFLUIDIC DEVICES
Arturs Abols[1], Miks Priedols[2], Felikss Rumnieks[1], Sintija Erentraute[1], Gunita Paidere[2], Karlis Grindulis[2], Gatis Mozolevskis[2], and Roberts Rimsa[2]
[1]Latvian Biomedical Research and Study Centre, LATVIA and [2]University of Latvia, LATVIA

T2A-333.e REPEATABLE AND RECONFIGURABLE CONTROL OF DNA ORIGAMI ORIENTATION USING DIELECTROPHORESIS
Dongwon Lee[1], Qinyi Lu[2], Doohwan Jung[1], Yonggang Ke[2], and Hua Wang[1]
[1]Georgia Institute of Technology, USA and [2]Emory University, USA

T3B-446.e AIR BUBBLES TRAPPING, COLLECTION AND ELIMINATION IN AQUEOUS CHANNELS
Udara Bimendra Gunatilake, Yara Alvarez-Braña, Edilberto Ojeda, Lourdes Basabe-Desmonts, and Fernando Benito-Lopez
University of the Basque Country, SPAIN

T3C-447.e OPTIMIZING STEREOLITHOGRAPHIC 3D-PRINTED MATERIALS FOR ON-CHIP PRIMARY IMMUNE CELL CULTURE
Hannah Musgrove, Megan Catterton, and Rebecca R. Pompano
University of Virginia, USA

T3A-448.e FABRICATION AND BONDING OF INDEX-MATCHED CELL TRAP ARRAYS FOR ON-CHIP DRUG SCREENING ASSAYS
Edward R. Polanco, Justin Griffin, and Thomas A. Zangle
University of Utah, USA

T3B-449.e AFFIBODY FUNCTIONALIZED MICROBEADS: A NOVEL AND FACILE PLATFORM FOR ULTRA-SENSITIVE DETECTION OF EXOSOMES
Sareh Zhand[1], Sajad Razavi Bazaz[1], Nima Sayyadi[2], and Majid Ebrahimi Warkiani[1]
[1]University of Technology Sydney, AUSTRALIA and [2]Macquarie University, AUSTRALIA

T3C-450.e INHIBITION OF PROTEIN ADSORPTION BY POLY VINYL ALCOHOL MODIFICATION OF PDMS AND ITS APPLICATION TO SINGLE STEP FLUORESCENT IMMUNOASSAY
Hao Liu[1], Mao Fukuyama[1], Motohiro Kasuya[1], Sho Onose[3], Koji Shigemura[3], Manabu Tokeshi[2], and Akihide Hibara[1]
[1]Tohoku University, JAPAN, [2]Hokkaido University, JAPAN, and [3]Tianma Japan, Ltd., JAPAN

W4B-570.e EXPERIMENTAL PREDICTION OF CONTACT ANGLE CHANGE ON PDMS MICRO-PILLAR STRUCTURES
Sho Yokoyama
Osaka Institute of Technology, JAPAN

W4C-571.e A HYDROGEL MICRONEEDLE-BASED BIOSENSOR INTEGRATING APTAMER PROBES AND FLUORESCENCE DETECTION FOR BIOMARKER QUANTIFICATION
Hanjia Zheng[1], Amin GhavamiNejad[2], and Mahla Poudineh[1]
[1]University of Waterloo, CANADA and [2]University of Toronto, CANADA

e - Micro- and Nanoengineering
Others

T2B-334.e A NEW GRAVITY-DRIVEN MICROFLUIDIC SIPHON
Kirandeep K. Gill[1], Sarah H. Needs[2], Sophie M. Jegouic[2], Scott Howard[1], Jack Kempe[1], Shaan Bola[1], Kareem Al-Hakeem[1], Alexander D. Edwards[2], and Nuno M. Reis[1]
[1]University of Bath, UK and [2]University of Reading, UK

T2C-335.e IN-LINE DEGASSER AND INTEGRATED 3D PRINTED PLATFORM TO INCREASE THE POWER OF ENGINEERED ON-CHIP CULTURE MODELS
Amirus Saleheen, Hannah B. Musgrove, and Rebecca R. Pompano
University of Virginia, USA

f - Sensors and Detection Technologies
Chemical and Electrochemical Sensors

M1C-265.f OLFACTORY RECEPTOR-MIMETIC PEPTIDE MODIFIED GRAPHENE FIELD EFFECT TRANSISTOR SENSOR FOR LIMONENE SENSING
Tharatorn Rungreungthanapol[1], Chishu Homma[1], Masayoshi Tanaka[1], Yoshiaki Sugizaki[2], Atsunobu Isobayashi[2], Yuhei Hayamizu[1], and Mina Okochi[1]
[1]Tokyo Institute of Technology, JAPAN and [2]Toshiba Corporation, JAPAN

M1A-266.f CRISPR-BASED ELECTROCHEMICAL SENSOR FOR COVID-19 DIAGNOSTICS
Joshua Rainbow[1,2], Helena de Puig[1,3], Pawan Jolly[1], Sanjay Sharma Timilsina[1], Pedro Estrela[2], James J. Collins[1,3,4], and Donald E. Ingber[1,5]
[1]Harvard University, USA, [2]University of Bath, UK, [3]Massachusetts Institute of Technology, USA, [4]Broad Institute of MIT and Harvard, USA and [5]Boston Children's Hospital and Harvard Medical School, USA

M1B-267.f HIGH RESOLUTION, ONE-SHOT IMAGING OF CELLULAR ACTIVITY OF SPHEROIDS BY OXYGEN DEPENDENT ELECTROCHEMILUMINESCENCE
Kaoru Hiramoto, Kosuke Ino, Keika Komatsu, Yuji Nashimoto, and Hitoshi Shiku
Tohoku University, JAPAN

M1C-268.f AN ELECTROCHEMICAL BIOSENSING PLATFORM FOR RAPID DETECTION OF SARS-COV-2 ANTIBODIES
Ran Peng, Yueyue Pan, Zhijie Li, Zhen Qin, James M. Rini, and Xinyu Liu
University of Toronto, CANADA

M1A-269.f RAPID TRIAGE POINT OF CARE DIAGNOSTICS FOR TUBERCULOSIS
Mohanraj Ramasamy[1,2], Sharma Timilsina Sanjay[2], Nolan Durr[2], Pawan Jolly[2], Rushdy Ahamed[2], and Donald E. Ingber[2,3]
[1]University of Texas, Dallas, USA, [2]Harvard University, USA, and [3]Boston Children's Hospital and Harvard Medical School, USA

M1B-270.f IN SITU PHOSPHATE ANALYSIS USING INLAID MICROFLUIDICS
Sean Morgan[1], Eddy Luy[2], Lee Miller[2], Merle Pittman[2], Kirk Phelan[2], Mark Wright[2], Arnold Furlong[2], and Vincent Sieben[1]
[1]Dalhousie University, CANADA and [2]Dartmouth Ocean Technologies, CANADA

M1C-271.f ELECTRICAL ENZYMATIC ASSAY AT BIOMIMETIC SURFACES OF GRAPHENE FIELD-EFFECT TRANSISTOR ARRAY
Takao Ono[1,2], Kaho Kamada[1], Ryota Hayashi[1], Alba Rosa Piacenti[3], Calum Gabbutt[3], Naruto Miyakawa[4], Kaori Yamamoto[1], Nongluk Sriwilaijaroen[5,6], Hiroaki Hiramatsu[6], Yasushi Kanai[1], Tomohiro Koyama[1], Koichi Inoue[1], Shota Ushiba[4], Ayumi Shinagawa[4], Masahiko Kimura[4], Shin-ichi Nakakita[7], Toshio Kawahara[6], Yutaka Ie[1], Yohei Watanabe[8], Yasuo Suzuki[6], Daichi Chiba[1], Sonia Contera[3], and Kazuhiko Matsumoto[1]
[1]Osaka University, JAPAN, [2]Japan Science and Technology Agency (JST), JAPAN, [3]University of Oxford, UK, [4]Murata Manufacturing, JAPAN, [5]Thammasat University, THAILAND, [6]Chubu University, JAPAN, [7]Kagawa University, JAPAN, and [8]Kyoto Prefectural University of Medicine, JAPAN

M1A-272.f PICO OIL DROPLET SPILL DETECTION AND MONITORING USING IMPEDANCE SENSING BASED MICROFLUIDIC SYSTEM
Wael R. Aldhaheri, Shabbir Chowdhury, and Nebras M. Sobahi
King Abdulaziz University, SAUDI ARABIA

T2A-336.f MODELING AND MEASURING GLUCOSE CONSUMPTION BY CANCER SPHEROIDS IN HANGING DROPS USING INTEGRATED BIOSENSORS
Nassim Rousset, Rubén López Sandoval, Mario Matteo Modena, Andreas Hierlemann, and Patrick M. Misun
ETH Zürich, SWITZERLAND

T2B-337.f AC ELECTROTHERMAL FLOW-ENHANCED MAGNETO-IMMUNOSENSOR FOR RAPID PROTEIN QUANTIFICATION IN BLOOD
Jiran Li, Kavya Singampalli, and Peter B. Lillehoj
Rice University, USA

T2C-338.f THERMOPLASTIC ELECTRODE SENSOR MODULES FOR ON-LINE SENSING WITH ORGAN-ON-A-CHIP DEVICES
Brandaise Martinez, Amanda Roley, Kaylee Clark, and Charles S. Henry
Colorado State University, USA

T2A-339.f BIOLOGICAL NANOPORE PROBE FOR SICM APPLICATIONS
Ryo Yoshihara and Kan Shoji
Nagaoka University of Technology, JAPAN

T2B-340.f A WEARABLE GRAPHENE TRANSISTOR-BASED BIOSENSOR FOR MONITORING IL-6 BIOMARKER
Kaitlyn E. Laliberte, Patrick Scott, Niazul I. Khan, Md Shaad Mahmud, and Edward Song
University of New Hampshire, USA

T2C-341.f HIGH SENSITIVE LSPR SENSOR FOR REFRACTIVE INDEX OF SOLVENT USING MONODISPERSE GOLD NANOPARTICLES
Mao Hamamoto and Hiromasa Yagyu
Kanto Gakuin University, JAPAN

T2A-342.f MICROFLUIDIC PLATFORM OF ELECTROCHEMICAL BIOSENSORS FOR ORGAN-ON-CHIP APPLICATIONS
Ayman Chmayssem, Nicolas Verplanck, François Boizot, Manuel Alessio, Lucinda Santos, Véronique Mourier, Séverine Vignoud, Fabrice Navarro, and Pascal Mailley
Université Grenoble Alpes, CEA-LETI, DTBS, FRANCE

T2B-343.f ELECTRONIC IMMUNOASSAY USING ENZYMATIC METALLIZATION ON MICROPARTICLES
Josiah Rudge, Neda Rafat, Madeline Hoyle, and Aniruddh Sarkar
Georgia Institute of Technology, USA

T2C-344.f PORTABLE, POINT-OF-CARE, BIOLOGICALLY ACTIVATED GRAPHENE TRANSISTORS FOR RAPID IDENTIFICATION AND QUANTIFICATION OF AGE-SPECIFIC CIRCULATING EXOSOMES
Jonalyn DeCastro[1], Reza Hajian[1,2], Jonathan Parkinson[2], Alex Kane[2], Nathan Wong[3], Brett Goldsmith[2], Irina Conboy[3], and Kiana Aran[1,2,3]
[1]Claremont Colleges, USA, [2]Cardea Bio Inc., USA, and [3]University of California, Berkeley, USA

T2A-345.f ENDURING HIGH IMPACT -- AN INORGANIC DETECTOR FOR THE ICY MOON PENETRATOR ORGANIC ANALYZER (IMPOA)
Chinmayee Govinda Raj[1], Cambrie Salyards[1], Mohamed Odeh[1], Nicholas Speller[1], Michael Cato[1], Zachary Duca[1], Jungkyu Kim[2], Philip Putman[3], Jason Epperson[3], and Amanda Stockton[1]
[1]Georgia Institute of Technology, USA, [2]Texas Tech University, USA, and [3]Sierra Lobo, USA

T2B-346.f A MOLECULARLY IMPRINTED POLYMER FUNCTIONALIZED ORGANIC TRANSISTOR-BASED SENSOR DEVICE FOR ATROPINE DETECTION
Qi Zhou and Tsuyoshi Minami
University of Tokyo, JAPAN

T2C-347.f A ZERO-POWER CAPACITIVE ETHYLENE SENSOR USING POTASSIUM PERMANGANATE/POLYIMIDE COMPOSITE THIN-FILMS
Aishwaryadev Banerjee, Chayanjit Ghosh, Shakir-ul Haque Khan, Adwait Deshpande, Erfan Pourshaban, Mohit U. Karkhanis, Seungbeom Noh, Hanseup Kim, and Carlos H. Mastrangelo
University of Utah, USA

T2A-348.f HIGH CURRENT DENSITY HYDROGELS FOR MEDIATION OF ENZYMATIC REDOX SENSING IN COMPLEX ENVIRONMENTS
Xinlei Chen, Julia Zakashansky, and Michelle Khine
University of California, Irvine, USA

T3A-451.f ANALYZING PARTICULATE MATTERS VIA SURFACTANT-ASSISTED MICROFLUIDIC IONIC CURRENT SENSING WITH MACHINE LEARNING-DRIVEN IDENTIFICATION
Keiko Fujino[1], Taisuke Shimada[1], Takao Yasui[1,2], Kazuki Nagashima[2,3], Takashi Yanagida[3,4], Noritada Kaji[1,4], and Yoshinobu Baba[1,5]
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T3B-452.f WEARABLE PATCH-TYPE DEVICE FOR TRANSEPIDERMAL POTENTIAL MONITORING WITH MICRONEEDLE AND FLEXIBLE ELECTRODE
Ryohei Takizawa, Yuina Abe, Natsumi Kimura, Hiroya Abe, and Matsuhiko Nishizawa
Tohoku University, JAPAN

T3C-453.f ULTRASENSITIVE MULTIPLEXED BIOMARKER DETECTION ENABLED BY ELECTROCHEMICAL SENSORS WITH AN ANTIFOULING COATING
Sanjay S. Timilsina[1], Nolan Durr[1], Pawan Jolly[1], and Donald E. Ingber[1,2]
[1]Harvard University, USA and [2]Harvard Medical School, USA

T3A-454.f ULTRASENSITIVE ELECTROCHEMICAL SENSOR PLATFORM FOR MULTIPLEXED DETECTION OF MULTIPLE ANTI-SARS-CoV-2 IgG
Sanjay S. Timilsina[1], Helena de Puig[1,2], Pawan Jolly[1], Joshua Rainbow[3], Nolan Durr[1], Pedro Estrela[3], James J. Collins[1,2,4], and Donald E. Ingber[1,5]
[1]Harvard University, USA, [2]Massachusetts Institute of Technology, USA, [3]University of Bath, UK, [4]Broad Institute of MIT and Harvard, USA, and [5]Boston Children's Hospital, and Harvard Medical School, USA

T3B-455.f DEVELOPMENT OF A HIGH SENSITIVITY ELECTROCHEMICAL DETECTION PLATFORM INTEGRATED WITH ACOUSTIC MICROSTREAMING TECHNIQUE
Chaozhan Chen, Bin Ran, Bo Liu, Huaying Chen, and Yonggang Zhu
Harbin Institute of Technology (Shenzhen), CHINA

T3C-456.f A HIGH PH SENSITIVITY AND LINEARITY PH SENSOR BASED ON A HIGH ELECTRON MOBILITY TRANSISTOR (HEMT) IN SERIES WITH A SCHOTTKY BARRIER DIODE (SBD)
Haozhe Sun, Qi Cheng, Yufeng Jin, Maojun Wang, and Zhenchuan Yang
Peking University, CHINA

T3A-457.f ANALYSIS AND DESIGN OF MOLECULAR ELECTRIC TRANSDUCERS FOR HIGH INPUT VELOCITY MEASUREMENT
Yunfei Liu, Jie Wang, Fanrui Meng, Chengchen Gao, Zhenchuan Yang, and Yilong Hao
Peking University, CHINA

T3B-458.f LABEL-FREE AND REAGENTLESS MOLECULARLY IMPRINTED SENSOR FOR RAPID SCREENING OF STEROID HORMONES
Sanjida Yeasmin, Bo Wu, and Li-Jing Cheng
Oregon State Univeristy, USA

T3C-459.f DETECTION OF CYTOCHROME C FROM MICRO-DISSECTED TUMORS IN MICROFLUIDIC ARRAYS USING APTAMER-BASED ELECTROCHEMICAL SENSORS
Tran N.H Nguyen[1], Lisa F. Horowitz[1], Adan D. Rodriguez[1], Mehdi Mehrabi[2], Daniel T. Schwartz[1], and Albert Folch[1]
[1]University of Washington, Seattle, USA and [2]University of Pretoria, SOUTH AFRICA

T3A-460.f A WATER-GATED ORGANIC TRANSISTOR WITH A MICROFLUIDIC SYSTEM FOR REAL-TIME DETECTION OF GLYPHOSATE
Kohei Ohshiro, Koichro Asano, Pierre Didier, Nicolas Lobato-Dauzier, Anthony J. Genot, Tsukuru Minamiki, Teruo Fujii, and Tsuyoshi Minami
Univesity of Tokyo, JAPAN

T3B-461.f WEARABLE ELECTROCARDIOGRAPHY (ECG) SENSOR-SYSTEM WITH LIQUID METAL IN STRETCHABLE-DEFORMABLE INTERCONNECTS (SDI)
Anan Zhang, Alexandre Tessier, Chris Williams, and Shideh Kabiri Ameri Abootorabi
Queen's University, CANADA

T3C-462.f THE DETECTION OF MERCURY(II) IONS USING FLUORESCENT GOLD NANOCLUSTERS ON A PORTABLE PAPER-BASED DEVICE
Jia-Hui Lin, Shih-Jie Chen, Jia-En Lee, and Chien-Fu Chen
National Taiwan University, TAIWAN

T3A-463.f ESSENCE – COST-EFFECTIVE, UNIVERSAL, MODULAR, ELECTROCHEMICAL SENSOR FOR RAPID, SENSITIVE, AND SELECTIVE DETECTION OF DNA, PROTEINS IN A LOW RESOURCE SETTING
Yu-Hsuan Cheng, Li Zhenglong, Charmi Chande, and Sagnik Basuray
New Jersey Institute of Technology, USA

T3B-464.f PARALLEL ISOLATION CHANNELS OF SOLUBLE SOLID REAGENTS FOR LONG-TERM USE NUTRIENT ANALYZER
Yoko Azuma[1,4], Toshihiro Kasama[1,4], Yoshishige Endo[1,4], Tetsushi Koide[2,4], Chiharu Sone[3,4], Masashi Komine[3,4], Atsushi Ogawa[3,4], and Ryo Miyake[1,4]
[1]University of Tokyo, JAPAN, [2]Hiroshima University, JAPAN, [3]Akita Prefectural University, JAPAN, and [4]Japan Science and Technology Agency (JST), JAPAN

W4A-572.f DESIGNING MULTIPLEXED BIOSENSORS FOR ON-SITE DIAGNOSTICS
Regina Glatz, H. Ceren Ates, Gerald A. Urban, and Can Dincer
University of Freiburg, GERMANY

W4B-573.f AN INEXPENSIVE µPAD FOR THE COLORIMETRIC DETECTION OF NERVE AGENTS IN ON-SITE SAMPLES USING A SMALL SAMPLE VOLUME
Akinori Yamaguchi[1,2], Hajime Miyaguchi[1], Akihiko Ishida[2], and Manabu Tokeshi[2]
[1]National Research Institute of Police Science, JAPAN and [2]Hokkaido University, JAPAN

W4C-574.f MODIFIED FLEXIBLE MICRONEEDLE ELECTRODE ARRAY UTILIZING MULTI-LAYERED NANOSTRUCTURE FOR WIDE LINEAR RANGE NONENZYMATIC GLUCOSE MONITORING
Kaidong Xia[1,2], Junshi Li[1], Dong Huang[1], Xiaohong Zhou[2], and Zhihong Li[1]
[1]Peking University, CHINA and [2]Tsinghua University, CHINA

W4A-575.f A NOVEL STRATEGY FOR POWER-FREE READOUT OF LOOP-MEDIATED ISOTHERMAL AMPLIFICATION USING POLYDOPAMINE INTEGRATED INTO A PAPER DEVICE FOR PATHOGEN DETECTION
Hanh An Nguyen and Nae Yoon Lee
Gachon University, KOREA

W4B-576.f POINT-OF-CARE MICROFLUIDIC PLATFORM FOR THE DETECTION OF KEY MOLECULES IN BLOOD RELATED TO DIFFERENT DISEASES
Beatriz Rebollo-Calderon, Elena Alberto Serrano, Antonio Calvo-López, Mar Puyol, and Julian Alonso-Chamarro
Autonomous University of Barcelona, SPAIN

W4C-577.f CAFETIÈRE-BASED PRE-CONCENTRATION AND PAD READOUT FOR ON-SITE HEAVY METAL ANALYSIS
Mila Sari, Samantha Richardson, Bongkot Ngamsom, Will Mayes, Mark Lorch, and Nicole Pamme
University of Hull, UK

W4A-578.f MONITORING SOIL pH VIA CAFETIÈRE FILTRATION AND PAD READOUT FOR ON-SITE ANALYSIS OF SOIL CHEMISTRY
Charles Nash[1], Philip Kamau[2], Jesse Gitaka[2], Nicole Pamme[1], and Samantha Richardson[1]
[1]University of Hull, UK and [2]Mount Kenya Universtiy, KENYA

W4B-579.f EFFICIENT ELECTROCHEMICAL SENSOR INTEGRATED INTO SILICON MICROFLUIDIC CHANNEL TO PREVENT BIOFOULING
Chris Kenji Brenden, Yan Zhang, Sungho Kim, Hrishikesh Iyer, Weihua Shi, and Yurii Vlasov
University of Illinois, Urbana-Champaign, USA

W4C-580.f HYBRID CATALYTIC FILM BASED ON REDUCED GRAPHENE OXIDE-PEDOT: PSS PROVIDING FAVORABLE INTERFACE TO SEROTONIN DETECTION
Seung Hyeon Ko[1,2], Seung Wook Kim[2], and Yi Jae Lee[1]
[1]Korea Institute of Science and Technology (KIST), KOREA and [2]Korea University, KOREA

W4A-581.f A 3D NONWOVEN ENZYMATIC ELECTROCHEMICAL BIOSENSOR
Natalie Perrault[1,2], Pascal Mailley[1], Frédéric Revol-Cavalier[1], Anne Perwuelz[2], and Philippe Vroman[2]
[1]Université Grenoble Alpes, CEA, LETI, FRANCE and [2]GEMTEX Laboratory, FRANCE

W4B-582.f MICROFLUIDIC CHIP FOR THE ELECTROCHEMICAL DETECTION OF MICRORNAs: SINGLE-BASE MISMATCH SPECIFICITY
Claire Poujouly, Jérémy Le Gall, and Jean Gamby
Université Paris-Saclay, CNRS, FRANCE

W4C-583.f DUAL-FUNCTION DEVICE FOR DETECTION OF INSECT OLFACTORY RECEPTOR ACTIVITY
Hisatoshi Mimura[1], Toshihisa Osaki[1], Sho Takamori[1], and Shoji Takeuchi[1,2]
[1]Kanagawa Institute of Industrial Science and Technology, JAPAN and [2]University of Tokyo, JAPAN

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M1B-273.f QUANTIFICATION OF THROMBUS KINETICS THROUGH INHIBITING RECEPTOR SHEDDING WITH LABEL-FREE IMAGING FLOW ASSAY
Yujie Zheng, Samantha J. Montague, Yean J. Lim, Elizabeth E. Gardiner, and Woei Ming Lee
Australian National University, AUSTRALIA

M1C-274.f* ONE-CLICK MICROFLUIDIC SYSTEM FOR RAPID DETECTION OF CORTISOL BY COMPETITIVE ELISA WITH ELECTROSPUN MICROFIBER SUBSTRATE
Yecan Wang[1], Kohji Murakami[1], Toshihiro Kasama[1], Satoru Shinkawa[2], Shigenobu Mitsuzawa[2], Ryo Miyake[1], and Madoka Takai[1]
[1]University of Tokyo, JAPAN and [2]Honda R&D Co., Ltd, JAPAN

M1A-275.f AUTOMATED MICROFLUIDIC RAMAN SPECTROSCOPY SYSTEM
Jaehwan Kim, Nili Persits, and Rajeev J. Ram
Massachusetts Institute of Technology, USA

M1B-276.f HIGH QUANTUM YIELD YELLOW CARBON DOTS FOR SENSITIVE METAL ION DETECTION
Sanjida Yeasmin, Bo Wu, and Li-Jing Cheng
Oregon State Univeristy, USA

M1C-277.f INEXPENSIVE IMMERSIVE DISPLAY FOR 3D IMAGING FLOW ASSAYS
Junxiang Zhang, Avinash Upadhya, Tienan Xu, Zhiduo Zhang, and Woei Ming Lee
Australian National University, AUSTRALIA

T2B-349.f DETERMINATION OF NITRITES IN REAL WATER SAMPLES USING AN IONOGEL-BASED HYBRID POLYMER-PAPER HANDHELD DEVICE
Raquel Catalan-Carrio[1], Janire Saez[1], Lourdes Basabe-Desmonts[1,2], and Fernando Benito-Lopez[1]
[1]University of the Basque Country, SPAIN and [2]IKERBASQUE, SPAIN

T2C-350.f HIGHLY SENSITIVE DETECTION OF MET USING SUPPORT VECTOR MACHINE ON A PORTABLE FLUORESCENT ANALYZER WITH UCNP-BASED LATERAL FLOW ASSAY
Lei Huang[1], Shulin Tian[1], Wenhao Zhao[1], Ke Liu[1], Xing Ma[2], and Jinhong Guo[1]
[1]University of Electronic Science and Technology of China, CHINA and
[2]Harbin Institute of Technology, CHINA

T2A-351.f ALGINATE BEAD BIOSENSORS FOR THE DETERMINATION OF LACTATE LEVELS USING IMAGE ANALYSIS
Sandra Garcia-Rey[1], Edilberto Ojeda[1], Udara Bimendra Gunatilake[1], Lourdes Basabe-Desmonts[1,2], and Fernando Benito-Lopez[1]
[1]University of the Basque Country, SPAIN and [2]IKERBASQUE, SPAIN

T2B-352.f DUAL MEASUREMENT OF OPTICAL ABSORPTION AND SCATTERING OF SINGLE NANOPARTICLES IN FLOW BY NANOFLUIDIC OPTICAL DIFFRACTION
Yoshiyuki Tsuyama and Kazuma Mawatari
University of Tokyo, JAPAN

T2C-353.f SERS IN MICROCHANNELS FROM THE INTEGRATION OF A NANOSTRUCTURED SILVER LAYER BY ELECTRODEPOSITION AND STUDY OF THE PHOTHERMAL EFFECT
Brice Torti, Yannick Hallez, Benjamin Erable, and Fabien Chauvet
Université de Toulouse, FRANCE

T2A-354.f MICROFLUIDIC CONCENTRATION GRADIENT GENERATORS COMBINED WITH LEAKY WAVEGUIDES (LWs) FOR ANALYTE QUANTIFICATION
Ruchi Gupta[1] and Nicholas J. Goddard[2]
[1]University of Birmingham, UK and [2]Process Instruments (UK) Ltd, UK

T2B-355.f HYBRID NANOPARTICLE-NANOHOLE ARRAY SERS-ACTIVE NANOSTRUCTURES
Yazan Bdour, Graham Beaton, Kevin Stamplecoskie, and Carlos Escobedo
Queen's University, CANADA

T2C-356.f NUMERICAL AND EXPERIMENTAL INVESTIGATIONS OF PHOTOTHERMAL EFFECT IN NANOFLUIDIC CHANNELS
Hisashi Shimizu[1] and Takehiko Kitamori[1,2]
[1]University of Tokyo, JAPAN and [2]National Tsing Hua University, TAIWAN

T2A-357.f ADVANCES IN HIGH-SPEED IMAGE-BASED PARTICLE CHARACTERIZATION
Tobias Neckernuss[1,2], Patricia Schwilling[1], Jonas Pfeil[1,2], Daniel Geiger[1,2], and Othmar Marti[1]
[1]Ulm University, GERMANY and [2]Sensific GmbH, GERMANY

T2B-358.f POINT-OF-USE SINGLE STEP DEVICE FOR EARLY DETECTION OF VINEYARD INFECTIONS
Cristiana Domingues[1], Rui Meirinho[1], Ana Margarida Fortes[2], Virginia Chu[1], and João Pedro Conde[1,3]
[1]INESC-MN, PORTUGAL, [2]Universidade de Lisboa, PORTUGAL, and
[3]Instituto Superior Técnico, PORTUGAL

T3C-465.f HIGH-THROUGHPUT AND HIGH-SPEED ABSORBANCE MEASUREMENTS IN MICROFLUIDIC DROPLETS USING HYPERSPECTRAL IMAGING
Flore Mekki-Berrada, Jiaxun Xie, and Saif A. Khan
National University of Singapore, SINGAPORE

T3A-466.f HIGH-THROUGHPUT 3D-IMAGING FLOW CYTOMETRY WITH 1D ACOUSTOFLUIDIC FOCUSING
Masashi Ugawa[1,2] and Sadao Ota[1]
[1]University of Tokyo, JAPAN and [2]RIKEN, JAPAN

T3B-467.f IONIC LIQUID-BASED DYE (IL-DYE) NANOEMULSION (NE) AS A HIGH-SENSITIVITY ION SENSING COMPONENT OF MICROANALYTICAL DEVICES
Kaho Maki, Sueyoshi Kenji, Tatsuro Endo, and Hideaki Hisamoto
Osaka Prefecture University, JAPAN

T3C-468.f SELECTIVE HISTAMINE DETECTION USING FLUORESCENT ORGANIC NANOCRYSTAL-IMMOBILIZED-MICROFLUIDIC PAPER ANALYTICAL DEVICE
Grasianto, Mao Fukuyama, Motohiro Kasuya, Derrick Mott, Carlos Baptista,
Yoshitaka Koseki, Hitoshi Kasai, Tomoyuki Akutagawa, and Akihide Hibara
Tohoku University, JAPAN

T3A-469.f EMBEDDED SENSOR IN MICROFLUIDICS FOR TEMPERATURE AND FLOW RATE
Yigang Shen[1,2], Yaxiaer Yalikun[1,3], Doudou Ma[1,2], and Yo Tanaka[1,2]
[1]RIKEN, JAPAN, [2]Osaka University, JAPAN, and [3]Nara Institute of Science and Technology, JAPAN

T3B-470.f INTEGRATED FLUIDIC SENSOR SYSTEM FOR MULTIMODAL SPR DETECTION OF VARIOUS-SIZE MOLECULES
Suzuyo Inoue, Kenta Fukada, and Michiko Seyama
NTT Corporation, JAPAN

T3C-471.f COFFEE RING-BASED APTASENSOR WITH AUTOMATED IMAGE PROCESSING FOR THE DETECTION OF PESTICIDES
Joana Macagno[1], Gabriel S. Gerlero[2], María L. Satuf, and Claudio L.A. Berli
Universidad Nacional del Litoral, ARGENTINA

T3A-472.f INTEGRATED DIELECTROPHORESIS AND FLUORESCENCE ENHANCEMENT FOR DETECTION OF BIOMARKER MOLECULES
Kai Nellermoe, Sameera Lakshan, and Dharmakeerthi Nawarathna
North Dakota State University, USA

T3B-473.f PORTABLE MINIATURIZED DETECTOR FOR REAL-TIME MONITORING OF PHOTOSYNTHETIC OXIDATION OF 9,10-DIPHENYLANTHRACENE
Sammer Ul Hassan, Yi Pan, and Ho Cheung Shum
University of Hong Kong, HONG KONG

T3C-474.f CYSTEAMINE INDUCED PLASMONIC SWITCH ON LAB-ON-A-DISC
Mamata Karmacharya[1,2], Sumit Kumar[1,2], Chaeeun Lee[1,2], and Yoon-Kyoung Cho[1,2]
[1]Ulsan National Institute of Science and Technology (UNIST), KOREA and
[2]Institute for Basic Science (IBS), KOREA

T3A-475.f LOCALIZED PHOTONIC NANOJET ENABLED QUANTITATIVE OPTICAL ENHANCEMENT
Pengcheng Zhang[1], Bing Yan[2], Guoqiang Gu[1], Zitong Yu[1], Xi Chen[1], Zengbo Wang[2], and Hui Yang[1]
[1]Chinese Academy of Sciences (CAS), CHINA and [2]Bangor University, UK

T3B-476.f A DROPLET-BASED PHASE GRATING FOR REFRACTOMETRY AND VISCOMETRY
Nicolas Mesyngier and Ryan C. Bailey
University of Michigan, Ann Arbor, USA

T3C-477.f **REAL-TIME BIOSENSING PLATFORM BASED ON QUENCHING OF FLUORESCENCE**
Edwin J. Ortiz-Riaño, Mariana D. Avila-Huerta, and Eden Morales-Narváez
Centro de Investigaciones en Óptica A.C., MEXICO

T3A-478.f **COMPUTATIONAL SINGLE-OBJECTIVE LIGHT-SHEET MICROSCOPY FOR IMAGING MICROFLUIDICS**
Tienan Xu and Woei Ming Lee
Australian National University, AUSTRALIA

T3B-479.f **LABEL-FREE CLASSIFICATION OF BACTERIA IN ACOUSTOFLUIDIC DEVICES BASED ON AUTOFLUORESCENCE SPECTRUM ANALYSIS**
Bin Xu[1], Yuichiro Iwamoto[1], Masashi Ugawa[1,2], SangWook Lee[1,3], and Sadao Ota[1]
[1]University of Tokyo, JAPAN, [2]RIKEN, JAPAN, and [3]Inje University, KOREA

T3C-480.f **TWO-DIMENSIONAL FLOW CYTOMETRY REALIZED BY USING AN ARRAY OF TIME-GATED SINGLE PHOTON AVALANCHE DIODES**
Saori Tago[1], Kunihiko Iizuka[2], Takeshi Mitsunaka[2], Daiki Sato[2], Takahiro Shindo[2], Teruo Fujii[1], and Soo Hyeon Kim[1,3]
[1]University of Tokyo, JAPAN, [2]Sharp Corporation, JAPAN, and [3]Japan Science and Technology Agency (JST), JAPAN

W4A-584.f **DETECTION OF GRAM-NEGATIVE BACTERIA BY LIQUID CRYSTAL-BASED BIOSENSOR**
Mengjun Liu, Jiamei Chen, Ruizhi Yang, Yu Yang, Yifeng Wang, Minmin Zhang, and Lingling Shui
South China Normal University, CHINA

W4B-585.f **A VERSATILE DNA NANOTECHNOLOGY BASED COMPETITIVE FO-SPR ASSAY FOR FAST MEASUREMENTS IN PLASMA**
Annelies Dillen, Aurélie Mohrbacher, and Jeroen Lammertyn
Katholieke Universiteit Leuven, BELGIUM

W4C-586.f* **QUANTIFICATION OF ANTIBODY BINDING KINETICS ON CELLS AND TISSUES VIA FLUORESCENCE LIFETIME IMAGING**
Prerit Mathur[1,2], Anna Fomitcheva Khartchenko[1,2], Stavros Stavrakis[1], Govind V. Kaigala[2], and Andrew J. deMello[1]
[1]ETH Zürich, SWITZERLAND and [2]IBM Research Europe - Zürich, SWITZERLAND

W4A-587.f **QUASI-BOUND STATES IN THE CONTINUUM IN ALL-DIELECTRIC METASURFACE TOWARDS BIOSENSING**
Juan Wang[1], Julius Kühne[1], Theodosios Karamanos[2], Carsten Rockstuhl[2,3], Stefan A. Maier[1,4], and Andreas Tittl[1]
[1]Ludwig-Maximilians-Universität München, GERMANY, [2]Institute of Theoretical Solid State Physics, GERMANY, [3]Karlsruhe Institute of Technology, GERMANY, and [4]Imperial College London, UK

W4B-588.f **DIELECTRIC RESONANT METASURFACE FOR MULTIPLEXED NEAR-FIELD OPTICAL TRAPPING**
Donato Conteduca[1], Giuseppe Brunetti[2], Giampaolo Pitruzzello[1], Francesco Tragni[2], Kishan Dholakia[3], Thomas F. Krauss[1], and Caterina Ciminelli[2]
[1]University of York, UK, [2]Politecnico di Bari, ITALY, and [3]University of St Andrews, UK

W4C-589.f **SARS-CoV-2 PROTEINS AND BIOTOXIN DETECTION USING PHOTONIC RESONATOR SENSOR**
Binh T.T. Nguyen[1], Zhenyu Li[1], Hongwei Zhao[2], Xiaohong Zhou[3], Eric P.H. Yap[1], Yi Zhang[1], and Ai-Qun Liu[1]
[1]Nanyang Technological University, SINGAPORE, [2]Hainan University, CHINA, and [3]Tsinghua University, CHINA

W4A-590.f IN-LINE ANALYSIS OF LIQUIDS IN MICROFLUIDIC CHANNELS WITH LINE-FOCUSED RAMAN SPECTROSCOPIC IMAGING
W.J. Niels Klement, Wesley R. Browne, and Elisabeth Verpoorte
University of Groningen, NETHERLANDS

W4B-591.f STUDY OF PARTICLE SIZE AND MORPHOLOGY FOR THE MULTIPLEXED DETECTION OF EPITHELIAL OVARIAN CANCER
Sara Carvalho, Schan Dissanayake-Perera, Nikita Demchenko, Haonan Lu, Paula Cunnea, Christina Fotopoulou, Daniel Richards, Marta Broto, and Molly M. Stevens
Imperial College London, UK

W4C-592.f TEMPERATURE SENSING POLYMERIC NANOTHERMOMETER FOR BIOMEDICAL APPLICATIONS
Ashish Kumar[1], Venkanagouda S. Goudar[1], and Fan-Gang Tseng[1,2,3]
[1]National Tsing Hua University, TAIWAN, [2]Taipei Medical University Hospital, TAIWAN, and [3]Academia Sinica, TAIWAN

f - Sensors and Detection Technologies
Physical Sensors

M1A-278.f ULTRA-SENSITIVE ON-CHIP PRESSURE TRANSDUCER WITH FABRICATED ULTRA-THIN GLASS SHEET
Yapeng Yuan[1,2], Yaxiaer Yalikun[1,3], Yusufu Aishan[1,2], Yigang Shen[1,2], Satoshi Amaya[1], and Yo Tanaka[1,2]
[1]RIKEN, JAPAN, [2]Osaka University, JAPAN, and [3]Nara Institute of Science and Technology, JAPAN

M1B-279.f* A HYDROGEL-BASED IONIC DIODE ARRAY FOR ROBOTIC TACTILE SENSING
Pengfei Xu and Xinyu Liu
University of Toronto, CANADA

M1C-280.f DISPOSABLE CHIPLESS MICROWAVE-MICROFLUIDIC SENSOR FOR LABEL-FREE MULTIVARIABLE SWEAT ANALYSIS
Zahra Abbasi[1,2], Weijia Cui[2], Masoud Baghelani[3], and Carolyn L. Ren[2]
[1]University of Calgary, CANADA, [2]University of Waterloo, CANADA, and [3]University of Alberta, CANADA

M1A-281.f MULTI-POSITION MEASURABLE FLOW VELOCITY SENSOR ENABLED BY ULTRA-THIN GLASS SHEET
Yansheng Hao[1], Chaoying Fang[1], Yapeng Yuan[2], Kazunori Okano[1], Ryohei Yasukuni[1], Shaokoon Cheng[3], Yo Tanaka[2], Yoichiroh Hosokawa[1], Yang Yang[4], Ming Li[2], and Yaxiaer Yalikun[1,2]
[1]Nara Institute of Science and Technology, JAPAN, [2]RIKEN, JAPAN, [3]Macquarie University, AUSTRALIA, and [4]Institute of Deep-Sea Science and Engineering, CHINA

T2C-359.f DETECTION OF CALCIUM CARBONATE SCALE FORMATION ON A SiO2/Si3N4-MEMBRANE BY A THERMAL SENSOR SYSTEM IN REAL-TIME
Tobias Wieland, Krishan Kotthaus, and Gerald A. Urban
University of Freiburg, GERMANY

T2A-360.f ULTRA LOW ABUNDANCE BIOMOLECULE DETECTION VIA A MCROPORE
Ruiting Xu[1], Lydia Abune[2], Brandon Davis[2], Leixin Ouyang[1], Ge Zhang[1], Yong Wang[2], and Jiang Zhe[1]
[1]University of Akron, USA and [2]Pennsylvania State University, USA

T2B-361.f AN ALL-PVA TACTILE SENSOR WITH SCREEN PRINTED ELECTRODE FOR SUBTLE PRESSURE SENSING
Rajat Subhra Karmakar[1], Chia-Pei Chu[1], Yu-Jui Fan[2], Ying-Chih Liao[1], and Yen-Wen Lu[1]
[1]National Taiwan University, TAIWAN and [2]Taipei Medical University, TAIWAN

T2C-362.f **PROBING INTERNAL MATERIAL PROPERTIES OF CELLS AND MICROPARTICLES BY MICROWAVE SENSORS ON-CHIP**
Berk Kucukoglu, Uzay Tefek, Arda Secme, Hadi S. Pisheh, Hashim Alhmoud, and M. Selim Hanay
Bilkent University, TURKEY

T3A-481.f **ACCURACY EVALUATION OF MICROFLUIDIC SENSOR IN MONITORING SWEAT FLOW RATE AND ELECTROLYTE CONCENTRATION**
Yuki Hashimoto, Takako Ishihara, Kei Kuwabara, and Hiroyoshi Togo
NTT Corporation, JAPAN

T3B-482.f **HIGHLY DURABLE AND FLEXIBLE GLASS CANTILEVER FOR MEASURING SLIGHT DEFORMATION**
Yapeng Yuan[1,2], Yaxiaer Yalikun[1,3], Yigang Shen[1,2], Yusufu Aishan[1,2], and Yo Tanaka[1,2]
[1]RIKEN, JAPAN, [2]Osaka University, JAPAN, [3]Institute of Science and Technology, JAPAN

W4A-593.f **TIME-TEMPERATURE INDICATOR BASED ON THE OPTICAL RESPONSE OF PHOTONIC CRYSTALS UPON POLYMER INFILTRATION**
Luisa G. Cencha, Fernanda G. García, Nicolas Budini, Raúl Urteaga, and Claudio L.A. Berli
Universidad Nacional del Litoral-CONICET, ARGENTINA

W4B-594.f **QUANTITATIVE EVALUATION OF CONTRACTILITY WITH PDMS MICRO-PILLARS DURING ARTIFICIAL SKELETAL MUSCLE DEVELOPMENT**
Masaki Harada, Tomohiro Nakamura, and Sho Yokoyama
Osaka Institute of Technology, JAPAN

W4C-595.f **MICROFLUIDICS FOR MEASURING *DROSOPHILA* HEMOLYMPH VISCOSITY**
Alireza Zabihihesari, Shahrzad Parand, Arthur J. Hilliker, and Pouya Rezai
York University, CANADA

W4A-596.f **A HIGH PERFORMANCE AND SMALL SIZE FLEXIBLE PRESSURE SENSOR ARRAY BASED ON SILICON PIEZORESISTIVE CHIP**
Yunfei Liu, Jie Wang, Fanri Meng, Chengchen Gao, Zhenchuan Yang, and Yilong Hao
Peking University, CHINA

f - Sensors and Detection Technologies

Others

M1B-282.f* **MICROFLUIDIC PLATFORM FOR MULTI-FREQUENCY VISCOELASTIC PHENOTYPING OF SINGLE CELLS**
Andre Lai, Alan Dong, Michael Lustig, and Lydia L. Sohn
University of California, Berkeley, USA

T2A-363.f **IMPEDANCE CYTOMETRY FOR CHARACTERIZING SINGLE CELL SHAPE**
Tao Tang[1], Xun Liu[1], Yigang Shen[2], Yapeng Yuan[2], Tianlong Zhang[1,3], Kengo Suzuki[4], Yo Tanaka[2], Ming Li[3], Yoichiroh Hosokawa[1], and Yaxiaer Yalikun[1,2]
[1]Nara Institute of Science and Technology, JAPAN, [2]RIKEN, JAPAN, [3]Macquarie University, AUSTRALIA, and [4]Euglena Co. Ltd., JAPAN

T3C-483.f **SINGLE-CELL CYTOKINE DETECTION VIA CELL-ANCHORED CAPTURE MATRIX BASED ON DROPLET MICROFLUIDICS**
Ying Xu and Chia-Hung Chen
City University of Hong Kong, HONG KONG

g - Other Applications of Microfluidics

Artificial Intelligence and Microfluidics

M1C-283.g* **WHOLE-BRAIN CELL ANNOTATION FRAMEWORK COMBINED WITH ON-CHIP STIMULATION REVEALS STIMULUS ENCODING IN *C. ELEGANS***
Shivesh Chaudhary, Sol Ah Lee, Yueyi Li, Dhaval S. Patel, and Hang Lu
Georgia Institute of Technology, USA

M1A-284.g **SPEEDING UP MICROSCOPIC TESTICULAR SPERM EXTRACTION WITH CODED MICROWELL SYSTEM AND MORPHOLOGICAL ALGORITHM**
Yuriko Ezaki, Konosuke Kachi, and Masashi Ikeuchi
University of Tokyo, JAPAN

T2B-364.g **DEVELOPMENT AND VALIDATION OF A CELLULAR HOST RESPONSE TEST AS AN EARLY DIAGNOSTIC FOR SEPSIS**
Lionel Guillou[1], Roya Sheybani[1], Anne E. Jensen[1], Dino Di Carlo[1,2], Terrell Caffery[3], Christopher Thomas[3], Ajay M. Shah[1], Henry T.K. Tse[1], and Hollis R. O'Neal[3]
[1]Cytovale, USA, [2]University of California, Los Angeles, USA, and [3]Louisiana State University, USA

T2C-365.g **PARTICLE SIZE DETERMINATION VIA SUPERVISED MACHINE LEARNING IN MICROFLUIDIC IMPEDANCE SPECTROSCOPY**
Douwe S. de Bruijn[1], Henricus R.A. ten Eikelder[1], Vasileios A. Papadimitriou[2], Wouter Olthuis[1], and Albert van den Berg[1]
[1]University of Twente, NETHERLANDS and [2]Delft University of Technology (TU Delft), NETHERLANDS

T3A-484.g **MANIPULATION OF OXIDIZED LIQUID METAL IN MICROFLUIDIC CHIP FOR SOFT ROBOTIC SYSTEM APPLICATIONS**
Yi Xu, Jiaqi Zhu, Han Chen, and Zhigang Wu
Huazhong University of Science and Technology, CHINA

T3B-485.g **LEARNING DROPLETS, BUBBLES, AND THEIR DYNAMICS**
Youngjoon Suh, Chuanning Zhao, and Yoonjin Won
University of California, Irvine, USA

W4B-597.g **NEURAL NETWORKS AND IMPEDANCE SPECTROSCOPY FOR HIGH SPEED DIELECTRIC CHARACTERIZATION OF SINGLE-CELLS**
Federica Caselli[1], Daniel Spencer[2], Hywel Morgan[2], and Paolo Bisegna[1]
[1]University of Rome Tor Vergata, ITALY and [2]University of Southampton, UK

W4C-598.g* **SUPERVISED LEARNING ON IMPEDANCE CYTOMETRY DATA FOR DRUG SENSITIVITY DISTINCTION OF CANCER VERSUS FIBROBLAST CELLS**
Armita Salahi, Carlos Honrado, John Moore, Sara Adair, Todd Bauer, and Nathan Swami
University of Virginia, USA

W4A-599.g* **3D MICROSPHEROID ASSEMBLY CHARACTERIZATION IN MICROFLUIDIC DROPLETS BY DEEP LEARNING & AUTOMATED IMAGE ANALYSIS**
Martin Trossbach[1,2], Emma Åkerlund[2,3], Brinton Seashore-Ludlow[2,3], and Haakan Joensson[1,2]
[1]KTH Royal Institute of Technology, SWEDEN, [2]Science for Life Laboratory, SWEDEN, and [3]Karolinska Institute, Sweden, SWEDEN

g - Other Applications of Microfluidics

Fuel Cells and Energy

M1B-285.g CHOLESTEROL LATERAL-FLOW MICROFLUIDIC BIOFUEL CELL
Johannes P. Martinez-Mórales[1], Julio C. Lopez-Rivas[1], Cristian E. Flores-Arreola[1], Luis A. Estrada-Jimenez[1], Andres Dector[2], Abraham U. Chavez-Ramirez[3], Alejandra Alvarez[1], Juan Galindo-de-la-Rosa[1], Vanessa Vallejo-Becerra[1]
[1]Universidad Autónoma de Querétaro, MEXICO, [2]Universidad Tecnológica de San Juan Del Rio, MEXICO, and [3]Centro de Investigación Y Desarrollo Tecnológico en Electroquímica, MEXICO

T2A-366.g EXAMINING MULTIPLE-CONTACT MISCIBILITY IN RESERVOIR DRAINAGE USING A ROCK-ON-A-CHIP
Hanbang Zou[1,2], Anja C. Slim[2], and Adrian Neild[2]
[1]Lund University, SWEDEN and [2]Monash Univeristy, AUSTRALIA

W4B-600.g MICROBIAL ANODE DEVELOPMENT USING *SACCHAROMYCES CEREVISIAE* FOR MICROFLUIDIC FUEL CELL APPLICATION
Alan Garcia-Villagómez[1], Andres Dector[2], Alejandra Alvarez[1], Abraham U. Chavez-Ramirez[3], Juan Galindo-de-la-Rosa[1], Vanessa Vallejo-Becerra[1]
[1]Universidad Autónoma de Queréta-ro, MEXICO, [2]Universidad Tecnológica de San Juan del Río, MEXICO, and [3]Centro de Investigación y Desarrollo Tecnológico en Electroquímica, MEXICO

W4C-601.g MICROFLUIDIC EYE-TEAR POWER FOR SMART CONTACT LENSES: ENERGY HARVESTING BY NATURAL EYE-BLINKING
Erfan Pourshaban, Mohit U. Karkhanis, Adwait Deshpande, Aishwaryadev Banerjee, Chayanjit Ghosh, Hanseup Kim, and Carlos H. Mastrangelo
University of Utah, USA

g - Other Applications of Microfluidics

Microfluidics for X-Ray and e-Beam Applications

M1C-286.g POLYMER BASED CENTRIFUGAL DEVICE FOR ON CHIP CRYSTALLIZATION AND IN SITU X-RAY CRYSTALLOGRAPHY
Sarthak Saha and Sarah L. Perry
University of Massachusetts, USA

T2B-367.g MICROFLUIDIC DEVICES FOR MEMBRANE PROTEIN CRYSTALLIZATION AND STRUCTURE DETERMINATION
Abhik Manna, Mukul Sonker, and Alexandra Ros
Arizona State University, USA

T3C-486.g A THREE DIMENSIONAL HYDRODYNAMIC FOCUSING MIXING DEVICE FOR X-RAY SPECTROSCOPY
Thomas Kroll[1], Diego A. Huyke[2], Augustin Braun[2], Leland B. Gee[2], Ashwin Ramachandran[2], Dimosthenis Sokaras[1], Britt Hedman[1], Uwe Bergmann[1], Edward I. Solomon[2], Mario U. Delgado-Jaime[3], Daniel D. DePonte[1], and Juan G. Santiago[2]
[1]SLAC National Accelerator Lab, USA, [2]Stanford University, USA, and [3]University of Guadalajara, MEXICO

g - Other Applications of Microfluidics

Others

M1A-287.g NUMERICAL AND EXPERIMENTAL ANALYSIS OF THE VIBRATION-INDUCED FLOW AROUND COMPLEX PILLAR SHAPES
Taku Sato[1], Huang Zhitai[1], Naoto Ujikawa[1], Kanji Kaneko[1], Yosuke Hasegawa[2], Takeshi Hayakawa[1], and Hiroaki Suzuki[1]
[1]Chuo University, JAPAN and [2]University of Tokyo, JAPAN

T2C-368.g WISDOM TEETH: SAMPLE PREPARATION OF MAMMOTH TOOTH ENAMEL FOR DATING USING AMINO ACID RACEMIZATION
Laila Patinglag[1], Marc Dickinson[2], Kirsty E.H. Penkman[2], and Kirsty J. Shaw[1]
[1]Manchester Metropolitan University, UK and [2]University of York, UK

W4A-602.g NON-THERMAL PLASMA-BASED INACTIVATION OF BACTERIA IN WATER USING A MICROFLUIDIC REACTOR
Laila Patinglag[1], Louise M. Melling[1], Kathryn A. Whitehead[1], David Sawtell[1], Alex Iles[2], and Kirsty J. Shaw[1]
[1]Manchester Metropolitan University, UK and [2]University of Hull, UK

W4B-603.g* WORKFLOW FOR ON-SITE EXTRACTION AND ANALYSIS OF NITRATE IN SOIL
Samira Al Hinai, Samantha Richardson, Mark Lorch, and Nicole Pamme
University of Hull, UK

W4C-604.g QUANTITATIVE URINE CYTOLOGY USING SINGLE-LAYER FLOW FOCUSING DEVICE
Gangadhar Eluru, Abhishek Pathak, and Sai S. Gorthi
Indian Institute of Science, INDIA

g - Other Applications of Microfluidics

Academic Benefactor

W4B-405.g UNIVERSITY OF KANSAS NANOFABRICATION FACILITY: CAPABILITIES AND SERVICES
Ryan J. Grigsby and Susan M. Lunte
University of Kansas, USA

h - Late News

Cells, Organisms and Organs on a Chip

M1B-288.h 96-WELL FORMAT-BASED MICROFLUIDIC PLATFORM FOR HIGH-THROUGHPUT DRUG SCREENING
Chaewon Jin, Hongsoo Choi, and Jin-young Kim
Daegu Gyeongbuk Institute of Science and Technology (DGIST), KOREA

M1C-289.h ON-CHIP MAGNETOTACTIC BACTERIA VIABILITY STUDIES UNDER BIOLOGICAL STRESSORS
Stephanie Walton and Carlos Escobedo
Queen's University, CANADA

T2A-369.h 3D BLOOD VESSELS-ON-A-CHIP FOR ATHEROSCLEROSIS MODELLING
Heleen H.T. Middelkamp, Albert van den Berg, Andries D. van der Meer
University of Twente, NETHERLANDS

T2B-370.h MICROFLUIDIC MULTI-TISSUE PLATFORM FOR SYSTEMIC EMBRYOTOXICITY TESTING ALONG THE MATERNAL-PLACENTAL-EMBRYONIC AXIS
Julia A. Boos[1], Patrick M. Misun[1], Giulia Brunoldi[1], Lea A. Furer[2], Leonie Aengenheister[2], Mario Modena[1], Nassim Rousset[1], Tina Buerki-Thurnherr[2], and Andreas Hierlemann[1]
[1]ETH Zürich, SWITZERLAND and
[2]Swiss Federal Laboratories for Materials Science and Technology, SWITZERLAND

T2C-371.h 3D PRINTED MAGNETIC ROBOTS FOR CELL DELIVERY WITH TUNED FLEXIBILITY
Veronika Magdanz[1], Arnau Llobera[1], Judith Fuentes[1], Dalia Mahdy[2], Islam S.M. Khalil[3], Maria Guix[1], and Samuel Sanchez[1,4]
[1]Barcelona Institute of Science and Technology (BIST), SPAIN, [2]German University in Cairo, EGYPT, [3]University of Twente, NETHERLANDS, and
[4]Institució Catalana de Recerca i Estudis Avancats (ICREA), SPAIN

T2A-372.h HIGH-THROUGHPUT IN VITRO CELL CULTURE PLATFORM WITH INTEGRATED SEROTONIN SENSOR TO TARGET THE GUT-BRAIN AXIS
Ashley A. Chapin and Reza Ghodssi
University of Maryland, USA

T2B-373.h MONITORING CELL SPHEROID FORMATION AND CULTURE IN POROUS MEMBRANE MICROWELLS BY ELECTRICAL IMPEDANCE
Alexander P.M. Guttenplan[1], Maria Gabriella Fois[1], Thijs Vandenryt[2], Seppe Bormans[2], Zeinab Tahmasebi Birgani[1], Stefan Giselbrecht[1], Roman K. Truckenmüller[1], Ronald Thoelen[2], and Pamela Habibovic[1]
[1]Maastricht University, NETHERLANDS and [2]Hasselt University, BELGIUM

T2C-374.h MICROFLUIDIC PLATFORM FOR CONTINUOUS PERFUSION OF TRANSWELL-BASED BARRIER MODELS
Amanzhol Kurmashev, Julia A. Boos, Mario Modena, Andreas Hierlemann
ETH Zurich, SWITZERLAND

T2A-375.h A 3D ENGINEERED TUMOUR-TISSUE MODEL THAT ENABLES IMAGE-BASED CONTINUOUS MONITORING OF PATIENT-DERIVED ORGANOIDS
Nila C. Wu, Jose L. Cadavid, Simon Latour, Xinzhu Tan, and Alison P. McGuigan
University of Toronto, CANADA

T2B-376.h A TISSUE CHIP DEVICE FOR INVESTIGATING PEDIATRIC PULMONARY ARTERIAL HYPERTENSION (PAH) PATHOPHYSIOLOGY AND DEVELOPING AGE-SPECIFIC THERAPY
Trieu Nguyen and Fakhrul Ahsan
California Northstate University, USA

T2C-377.h DEVELOPMENT OF A POLYMER-BASED MICROFLUIDIC DEVICE FOR CULTURING LIVER CELLS TOWARDS LIVER-ON-A-CHIP APPLICATION
Akbota Kurmangaliyeva, Galiya Toxeitova, and Gulsim Kulsharova
Nazarbayev University, KAZAKHSTAN

T3A-487.h BIOINSPIRED THREE-DIMENSIONAL MULTIPLEXED CROSS-FLOW DROPLET GENERATOR
Jonathan S. O'Connor[1,2], Leon Abelmann[1,2,3], Baeckkyoung Sung[1,4], and Andreas Manz[1,2]
[1]KIST Europe, GERMANY, [2]Universität des Saarlandes, GERMANY, [3]University of Twente, NETHERLANDS, and [4]University of Science & Technology, KOREA

T3B-488.h FULLY-INTEGRATED SILICON NITRIDE MICROPORE ON PLASTIC MICROFLUIDIC CHIPS FOR SIMULTANEOUSLY REAL-TIME COUNTING AND IMPEDANCE MEASUREMENT OF ESCHERICHIA COLI
Guo-Wei Li[1], Chien-Chong Hong[1], Tong-Miin Liou[1], Kuo Chu Hwang[1], and Chie-Pein Chen[2]
[1]National Tsing Hua University, TAIWAN and [2]MacKay Memorial Hospital, TAIWAN

T3C-489.h SINGLE-CELL TEMPORAL QUANTIFICATION PLATFORM OF SECRETED EXTRACELLULAR VESICLE
Kazuki Hattori[1], Yuki Goda[1], Yusuke Yoshioka[2], Ryosuke Kojima[1], and Sadao Ota[1]
[1]University of Tokyo, JAPAN and [2]Tokyo Medical University, JAPAN

h - Late News

Diagnostics, Drug Testing and Personalized Medicine

M1A-290.h ONE-STEP AMPLIFICATION-FREE BACTERIA DETECTION BY OPTIMIZED LNA/DNA MOLECULAR BEACONS IN DROPLETS
Yu-Ting Kao[1,2], Silvia Calabrese[3], Nadine Borst[1,3], Michael Lehnert[3], Yu-Kai Lai[1], Franziska Schlenker[3], Roland Zengerle[1,3], Piotr Garstecki[2], and Felix von Stetten[1,3]
[1]University of Freiburg, GERMANY, [2]Polish Academy of Sciences, POLAND, and [3]Hahn-Schickard, GERMANY

M1B-291.h ANTIGEN-SPECIFIC T CELL ACTIVATION USING FLUIDIC LIPID DROPLETS AS ARTIFICIAL ANTIGEN PRESENTING CELLS
Jui-Yi Chen, Sudhanshu Agrawal, Anshu Agrawal, and Abraham Lee
University of California, Irvine, USA

T2A-378.h AN ELECTROKINETIC MICROFLUIDIC PLATFORM FOR SOLID-PHASE CELL FREE DNA EXTRACTION FROM PLASMA FOR NON-INVASIVE PRENATAL TESTING (NIPT)
Lindsay Schneider, Thomas Usherwood, and Anubhav Tripathi
Brown University, USA

T2B-379.h LATERAL FLOW DEVICE FOR THE DUAL DETECTION OF SARS-COV 2 CORONAVIRUS NUCLEOCAPSID AND SPIKE PROTEIN: A RAPID, POINT-OF-CARE TESTING SOLUTION FOR COVID-19 MASS SCREENING
Alice Iles, Peijun J.W. He, Maria V. Humbert, Anto K. John, Ioannis N. Katis, Tristan Clark, Myron Christodoulides, Robert W. Eason, Christopher McCormick, and Collin L. Sones
University of Southampton, UK

T2C-380.h A MICROFLUIDIC CHIP FOR COVID-19 NUCLEIC ACID EXTRACTION
Bingqian Kou, Haoqing Zhang, Hanliang Zhu, and Pavel Neuzil
Northwestern Polytechnical University, CHINA

T2A-381.h RAPID ANTIICROBIAL SUSCEPTIBILITY TESTING USING DROPLET-BASED MICROFLUIDIC DEVICE
Jae Seong Kim[1], Byungjin Lee[1], Heon-Ho Jeong[2], and Chang-Soo Lee[1]
[1]Chungnam National University, KOREA and [2]Chonnam National University, KOREA

T2B-382.h IMMUNOCOMPETENT MICROPHYSIOLOGICAL SYSTEM FOR SIMULTANEOUS EFFICACY AND SAFETY ASSESSMENT OF IMMUNE-CELL-BASED ANTI-CANCER THERAPIES
Oanh T.P. Nguyen, Patrick M. Misun, Christian Lohasz, Jihyun Lee, and Andreas Hierlemann
ETH Zürich, SWITZERLAND

T2C-383.h IMMISCIBLE FILTRATION DEVICE FOR EXTRACTION, AMPLIFICATION AND CRISPR-Cas DETECTION OF SARS-CoV-2 RNA
Bongkot Ngamsom[1], Alexander Iles[1], Pablo Rodriguez-Mateos[1], Moses Kamita[2], Racheal Kimani[2], Charlotte E. Dyer[1], Cheryl Walter[1], Jesse Gitaka[2], and Nicole Pamme[1]
[1]University of Hull, UK and [2]Mount Kenya University, KENYA

T2A-384.h CASCADED FILTER DETERMINISTIC LATERAL DISPLACEMENT MICROCHIPS FOR ISOLATION AND MOLECULAR ANALYSIS OF CIRCULATING TUMOR CELLS AND FUSION CELLS

Zongbin Liu[1], Yuqing Huang[2], Hongtao Feng[2], and Yan Chen[2]
[1]Shenzhen Zigzag Biotechnology Co., Ltd., CHINA and [2]Chinese Academy of Sciences (CAS), CHINA

T2B-385.h OLIGONUCLEOTIDE TEMPLATED REACTIONS ON A PAPER-BASED DEVICE FOR THE EARLY PREDICTION OF PRETERM BIRTH

Loukia Petrou, Maria Arianoglou, Sung Hye Kim, Phillip R. Bennett, Vasso Terzidou, and Sylvain Ladame
Imperial College London, UK

T2C-386.h PAPER-BASED MICROFLUIDIC ASSAY FOR RAPID DETECTION OF SARS-CoV-2

Pavithra Sukumar, Alla Saleh, and Mohammad A. Qasaimeh
New York University, Abu Dhabi, UAE

T2A-387.h FINGER-POWERED MICROFLUIDIC CHIP FOR SARS-CoV-2 POINT-OF-CARE TESTING

Yen-Wei Chang[1], Tung Sing Au Yeung[2], Helene Minyi Liu[2], Shih-Kang Fan[2], and Yen-Wen Lu[1]
[1]National Taiwan University, TAIWAN and [2]Kansas State University, USA

T2B-388.h BURST SENSING IN STEM CELL-DERIVED 3D NEURAL NETWORKS

Yagmur Demircan-Yalcin[1], Alex J. Bastiaens[1,3], Jean-Philippe Frimat[1,2], and Regina Luttge[1]
[1]Eindhoven University of Technology, NETHERLANDS, [2]Leiden University Medical Center (LUMC), NETHERLANDS, and [3]InnoSer Laboratories, NETHERLANDS

T2C-389.h ULTRA-FAST AND LOW-COST NUCLEIC ACID EXTRACTION FROM DRIED BLOOD SPOTS FOR POINT-OF-CARE MALARIA DIAGNOSTICS

Kenny Malpartida-Cardenas, Aubrey Cunnington, Jake Baum, Pantelis Georgiou,
and Jesus Rodriguez-Manzano
Imperial College London, UK

T2A-390.h IN VITRO DEMONSTRATION OF TUMOR EXTRAVASATION ON A HYBRID 3D METASTASIS-ON-A-CHIP DRUG SCREENING PLATFORM

Simrit Safarulla, Vikram Surendran, and Arvind Chandrasekaran
North Carolina A&T University, USA

T3A-490.h CRISPR-ELECTRONICS: CRISPR-POWERED GRAPHENE TRANSISTORS FOR FACILE DETECTION OF GENETIC MUTATIONS

Sarah Balderston[1,2], Antonia McDonnell Capossela[2], Reza Hajian[1,2], Elizabeth Celaya[2], and Kiana Aran[1,2]
[1]Keck Graduate Institute, USA and [2]Cardea Bio, USA

T3B-491.h NUCLEIC ACID AMPLIFICATION TEST (NAAT) CONDUCTED IN A MICROFLUIDIC CHIP TO DIFFERENTIATE BETWEEN VARIOUS GINSENG SPECIES

Christopher Oberc and Paul C.H. Li
Simon Fraser University, CANADA

T3C-492.h HIGHLY SENSITIVE DETECTION OF *SALMONELLA* TYPHIMURIUM USING TRYPTAMINE-FUNCTIONALIZED MAGNETIC NANOPARTICLES

Feixiong Chen and Tae Yoon Lee
Chungnam National University, KOREA

T3A-493.h MICROFLUIDIC SYSTEM FOR PHARMACEUTICAL DISSOLUTION TESTING

Ewelina Waleka-Bargiel[1,2], Artur Dybko[1], and Marcin Karbarz[2]
[1]Warsaw University of Technology, POLAND and [2]University of Warsaw, POLAND

T3B-494.h TRACKING THE SHEAR ALTERATIONS OF HUMAN CIRCULATING TUMOR CELLS VIA TIME-LAPSE IMAGING
Esra Yilmaz, Jason P. Beech, Zhimeng Fan, Chris Madsen, and Jonas O. Tegenfeldt
Lund University, SWEDEN

T3C-495.h QUICK SAMPLE PREPARATION FOR THE DETECTION OF CITRUS TRISTEZA VIRUS USING REVERSE TRANSCRIPTION QUANTITATIVE PCR
Chia-Wei Liu, Sohrab Bodaghi, Georgios Vidalakis, and Hideaki Tsutsui
University of California, Riverside, USA

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Fundamentals in Microfluidics and Nanofluidics

M1C-292.h USING AIRFLOW-DRIVEN, EVAPORATIVE GRADIENTS TO IMPROVE SENSITIVITY AND FLUID CONTROL IN COLORIMETRIC PAPER-BASED ASSAYS
Edward Wang, Zhilin Guo, Rui Tang, and Yu-Hwa Lo
University of California, San Diego, USA

M1A-293.h WIDE-FIELD IMAGING SYSTEM FOR REAL-TIME, MULTIPLEXED AND HIGH-THROUGHPUT DROPLET ANALYSIS
Sunghyun Ki, Hwicheol Shin, Joel Sanchez Barea, and Dong-Ku Kang
Incheon National University, KOREA

M1B-294.h CONTACLESS CELL PATTERNING VIA ACOUSTOFLUIDICS FOR ITS POTENTIAL USE IN TISSUE ENGINEERING APPLICATIONS
Karina P. Martinez Villegas, Reza Rasouli, and Maryam Tabrizian
McGill University, CANADA

M1C-295.h NUMERICAL SIMULATIONS ON ANALYTES FOCUSING VIA OUT OF PLANE FARADAIC ION CONCENTRATION POLARIZATION
Sungu Kim, Kumar Saurabh, Beatrise Berzina, Umesha Peramune, Robbyn K. Anand, and Baskar Ganapathysubramanian
Iowa State University, USA

M1A-296.h DEVELOPMENT OF A VERSATILE AND LOW-COST DROPLET MICROFLUIDIC PLATFORM FOR SINGLE-NUCLEI ATAC-SEQUENCING
Robert Baber[1,2], Mahsan Banijamali[2], Pontus Höjer[2], Afshin Ahmadian[2], and Aurélie Vigne[1]
[1]Elvesys, FRANCE and [2]Royal Institute of Technology (KTH), SWEDEN

M1B-297.h SPECIES ABUNDANCE AND REACTION OFF-RATE REGULATE PRODUCT FORMATION IN REACTIONS ACCELERATED USING ISOTACHOPHORESIS
Qi Jiang, Ashwin Ramachandran, and Juan G. Santiago
Stanford University, USA

T2B-391.h CONCENTRATION-POLARIZATION ELECTROOSMOSIS
Raul Fernández-Mateo[1], Victor Calero[1], Pablo Garciá-Sánchez[2], Antonio Ramos[2], and Hywel Morgan[1]
[1]University of Southampton, UK and [2]Universidad de Sevilla, SPAIN

T2C-392.h DEVELOPMENT OF AN AUTOMATED SEXUAL ASSAULT EVIDENCE PREPARATION MICRODEVICE WITH NOVEL LASER-ACTUATED VALVING
Larissa L. Cunha[1], M. Shane Woolf[1], Aeren Q. Nauman[1], Hannah M. Lewis[1], Kevyn C. Hadley[1], and James P. Landers[1,2]
[1]University of Virginia, USA and [2]MicroGEM International, PLC, USA

T2A-393.h AN OPEN MICRO-ELECTRO-FLUIDIC CHIP FOR RAPID DETECTION OF TYPE-2 DIABETES BASED ON RED BLOOD CELL DEFORMABILITY

Samuel Sofela[1,2], Dima Alli[1], Pavithra Sukumar[1], Muhammedin Deliorman[1], Ciara Rooney[3], Ryan Garrod[3], Rabih Hijazi[3], Hussein Saadi[3], and Mohammad A. Qasaimeh[1,2]
[1]New York University, Abu Dhabi, UAE, [2]New York University, USA, and [3]Cleveland Clinic, Abu Dhabi, UAE

T2B-394.h MULTIPLEXED FLUORESCENCE DETECTION FROM SINGLE CELLS IN MICROFLUIDIC DROPLETS USING ON-CHIP FIBRE OPTICS

Preksha Gupta[1], Apurv Mishra[1], Ambili Mohan[2], Pooja Mehta[1], Saurabh Umrao[1], Anil Prabhakar[2], and Taslimarif Saiyed[1]
[1]Centre for Cellular and Molecular Platforms, INDIA and [2]Indian Institute of Technology, Madras, INDIA

T3A-496.h CAPILLARY MICROFLUIDICS FOR IMMUNOASSAYS BY INTEGRATING 3D PRINTING AND PRESSURE-SENSITIVE ADHESIVE

Pooya Azizian[1,2], Elena Guerrero-SanVicente[1], Ruta Grinyte[1], Jasmina Casals-Terré[2], and Joan M. Cabot[1]
[1]Leitat Technological Center, SPAIN and [2]Technical University of Catalonia, SPAIN

T3B-497.h DEVELOPMENT OF MEASUREMENT TECHNIQUE FOR NANOCHANNEL FLOWS BY DEFOCUSING NANO-PARTICLE IMAGE VELOCIMETRY

Minori Tanaka[1], Itsuo Hanasaki[2], and Yutaka Kazoe[1]
[1]Keio University, JAPAN and [2]Tokyo University of Agriculture and Technology, JAPAN

T3C-498.h AUTOMATED, LOW COST AND ULTRASENSITIVE TARGET DETECTION: TOWARDS ENABLING DIGITAL POINT-OF-CARE TESTING

Karen Leirs[1], Francesco Dal Dosso[1], Elena Perez-Ruiz[1], Deborah Decrop[1], Ruben Cops[1], Jeffrey Huff[2], Mark Hayden[2], Nicholas Collier[3], Karen X.Z. Yu[3], Stephen Brown[3], and Jeroen Lammertyn[1]
[1]KU Leuven, BELGIUM, [2]Abbott Laboratories, USA, and [3]Sagentia, UK

T3A-499.h CONTROLLING PROTEIN CRYSTALLIZATION IN NANOLITER DROPLETS TREATED BY ELECTRICALLY INDUCED MICROBUBBLES

Naotomo Tottori[1], Azusa Takao[1], Akiho Hirao[1], Akira Shinoda[2], Akiyoshi Nakamura[3], Yusuke Yamada[2], Maasa Yokomori[4], Miho Tagawa[4], Shigeo S. Sugano[3], Shinya Sakuma[1], and Yoko Yamanishi[1]
[1]Kyushu University, JAPAN, [2]High Energy Accelerator Research Organization (KEK), JAPAN, [3]National Institute of Advanced Industrial Science and Technology (AIST), JAPAN, and [4]Nagoya University, JAPAN

W4A-605.h HIGH THROUGHPUT CAPILLARY-DRIVEN FLOW DEVICE FOR RAPID DETECTION OF NITRITE SAMPLE

Sammer Ul Hassan[1,2]
[1]University of Hong Kong, HONG KONG and [2]University of Southampton, UK

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Integrated Microfluidic Platforms

T2C-395.h AN OPEN-CHANNEL MICROFLUIDIC MEMBRANE DEVICE FOR *IN SITU* HYPERSPECTRAL MAPPING OF ENZYMATIC CELLULOSE HYDROLYSIS

Hoi-Ying N. Holman[1], Wujun Zhao[1], Jennifer D. Nill[2], Liang Chen[1], Sankar Raju Narayanasamy[1], and Tina Jeoh[2]
[1]University of California, Davis, USA and [2]Lawrence Berkeley National Laboratory, USA

T2A-396.h NANOHYBRIDS IN MICROFLUIDIC CHIPS FOR HETEROGENEOUS CATALYTIC REACTIONS

Joseph Farah, Edmond Gravel, Eric Doris, and Florent Malloggi
Université Paris-Saclay, FRANCE

T2B-397.h PHYSICAL PROPERTIES OF THE POLIDIMETILSILOXANE EFFECTS ON THE CRITICAL DIAMETER OF THE DETERMINISTIC LATERAL DISPLACEMENT-BASED MICROFLUIDIC PARTICLE SEPARATORS
Tamás Kós[1], Kristóf Iván[1], András József Laki[1,2]
[1]Pázmány Péter Catholic University, HUNGARY and [2]Semmelweis University, HUNGARY

T3B-500.h EVALUATION OF THE CAPTURING EFFICIENCY OF EXOSOME IN A MICROMIXER DRIVEN BY THE VIBRATION-INDUCED FLOW
Kanji Kaneko[1], Mamiko Tsugane[1], Taku Sato[1], Takeshi Hayakawa[1], Yosuke Hasegawa[2], and Hiroaki Suzuki[1]
[1]Chuo University, JAPAN and [2]University of Tokyo, JAPAN

T3C-501.h A STRETCHABLE MICROMIXER FOR MIXING ENHANCEMENT AT LOW REYNOLDS NUMBER
Hedieh Fallahi, Jun Zhang, and Nam-Trung Nguyen
Griffith University, AUSTRALIA

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Micro- and Nanoengineering

M1C-298.h MICROFLUIDIC DROP-ON-DEMAND INKJET PRINT HEADS FOR MULTI-RESOLUTION MULTI-MATERIAL THIN FILM LIBRARY PREPARATION
Anindya Lal Roy, Hsi Nien Chiu, and Konrad Walus
University of British Columbia, CANADA

M1A-299.h A MINIATURIZED PROGRAMMABLE MULTI-FLUIDIC PNEUMATIC SYSTEM FOR PRECISE CONTROLS OF SAMPLE PREPARATION ENVIRONMENT
Sankar Raju Narayanasamy[1], Ramakrishna Vasireddi[2], and Hoi-Ying Holman[1]
[1]Lawrence Berkeley National Laboratory, USA and [2]Synchrotron SOLEIL, FRANCE

M1B-300.h **Poster will be presented on Tuesday, in Poster Room T2B**
MULTIPLE-LEVEL SU-8 µTAS CHIP TRANSFER ONTO COVERSLIPS FOR BIOLOGICAL APPLICATIONS
Juan Pablo Agusil[1], Clara Llorente-González[2], Rocío Aguilar-Cuenca[2], Miguel Vicente-Manzanares[2], and José A. Plaza[1]
[1]Instituto de Microelectrónica de Barcelona (IMB-CNM, CSIC), SPAIN and
[2]Instituto de Biología Molecular y Celular del Cáncer (IBMCC, CSIC), SPAIN

M1C-301.h **Poster will be presented on Wednesday, in Poster Room W4C**
MULTIDIMENSIONAL ANISOTROPIC SU-8 MICROPARTICLES
Juan Pablo Agusil, María Isabel Arjona, Marta Duch, Naüm Fusté, and José A. Plaza
Instituto de Microelectrónica de Barcelona (IMB-CNM, CSIC), SPAIN

T2C-398.h MICRODROPLETS ON 3D PRINTED PILLARS FOR CELL AGGREGATION
Bisan Samara, Vahid Karamzadeh, and David Juncker
McGill University, CANADA

T2A-399.h VOLUMETRIC ADDITIVE MANUFACTURING OF TOUGH HYDROGELS VIA ROTATIONAL DLP LITHOGRAPHY
Fan-Hsuan Liu, Hsin-Yang Tsai, Liang-Yen Liu, and Yu-Chuan Su
National Tsing Hua University, TAIWAN

T3A-502.h INTEGRATION OF PHOTONIC SILICON CHIPS IN A 3D-PRINTED MICROFLUIDIC GRADIENT GENERATOR FOR ANTIMICROBIAL SUSCEPTIBILITY TESTING
John-Alexander Preuß[1], Christopher Heuer[1,2], Marc Buttkewitz[1], Sofia Arshavsky-Graham[2], Ester Segal[2], and Janina Bahnemann[1]
[1]Leibniz University Hannover, GERMANY and [2]Israel Institute of Technology, ISRAEL

T3B-503.h FABRICATING METAL MICROCHANNELS USING 3D PRINTING AND INFILTRATION
Isa M. Kohls, Henry Davis, James Harkness, Nathan Crane, Brian Jensen, Robert Davis, and Richard Vanfleet
Brigham Young University, USA

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Sensors and Detection Technologies

M1A-302.h **Poster will be presented on Wednesday, in Poster Room W4A**
ANCHORED SILICON CHIPS FOR ULTIMATE CELL TRACTION FORCES DETERMINATION
María Isabel Arjona[1], Mariano Redondo[2], Marta Duch[1], Ana Sánchez[1], Juan Pablo Agusil[1], Miguel A. Monclús[3], Jon M. Molina-Aldareguia[3], Teresa Suárez[2], and José A. Plaza[1]
[1]Instituto de Microelectrónica de Barcelona (IMB-CNM, CSIC), SPAIN,
[2]Centro de Investigaciones Biológicas-Margarita Salas (CIB, CSIC), SPAIN, and
[3]Instituto Madrileño de Estudios Avanzados de Materiales (IMDEA Materiales), SPAIN

M1B-303.h MULTIPLEXED DETECTION OF KRAS MUTATIONS WITH PCR INTEGRATED SERS
Joel Sanchez Barea, Sunghyun Ki, Hwicheol Shin, and Dong-Ku Kang
Incheon National University, KOREA

M1C-304.h LOW-COST TIME-OF-FLIGHT DROPLET CHARACTERIZATION FOR MICROFLUIDIC ASSAYS
Justin Farrell, Abdul Basit Zia, and Ian G. Foulds
University of British Columbia, CANADA

T2B-400.h AN ELECTRICAL IMPEDANCE MICROCHIP FOR CHARACTERIZATION OF EXTRACELLULAR VESICLES
Leilei Shi, Durude Mahee, and Leyla Esfandiari
University of Cincinnati, USA

T2C-401.h MULTI-ANALYTE GLYPHOSATE AND METAL ION DETECTION FOR LAB-ON-CHIP-BASED WATER MONITORING
Besnik Uka, Jochen Kieninger, Gerald A. Urban, Andreas Weltin
University of Freiburg, GERMANY

T2A-402.h COUPLING OF THERMOELECTRIC AND ELECTROCHEMICAL MEASUREMENTS FOR SINGLE STRANDED DNA FUNCTIONALIZATION ON GOLD ELECTRODES
Martina Freisa, Claire Poujouly, Isabelle Le Potier, and Jean Gamby
Université Paris-Saclay, FRANCE

T2B-403.h TOWARDS A WIRELESS, MULTIMODAL SENSING PLATFORM FOR DETECTING INFLAMMATORY MARKERS IN THE GI TRACT
Justin M. Stine[1], Santiago Botasini[1], Luke A. Beardslee[1], Pankja J. Pasricha[2], and Reza Ghodssi[1]
[1]University of Maryland, College Park, USA and [2]Johns Hopkins University, USA

T2C-404.h COMPACT, HIGH-RESOLUTION AND WIDE-FIELD HOLOGRAPHIC LENSLESS MICROSCOPE
Ekta Prajapati and Shishir Kumar
Indian Institute of Technology, INDIA

T3C-504.h *PLASMODIUM FALCIPARUM* DETECTION USING A PORTABLE LAB-ON-CHIP DIAGNOSTIC SYSTEM IN GHANA
Kenny Malpartida-Cardenas[1], Nicolas Moser[1], Felix Ansah[2], Ivana Pennisi[1], Aubrey Cunnington[1], Jake Baum[1], Gordon Awandare[2], Jesus Rodriguez-Manzano[1], and Pantelis Georgiou[1]
[1]Imperial College London, UK and [2]University of Ghana, GHANA

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Other Applications of Microfluidics

M1A-305.h SHAPE PREDICTION MODEL OF NANOPARTICLES BY ON-CHIP NANOPARTICLES TRACKING ANALYSIS & DEEP LEARNING

Hiroaki Fukuda[1], Hiromi Kuramochi[1], Hiroaki Takehara[1,2], and Takanori Ichiki[1,2]
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