



Preliminary Technical Program

The Executive Committee reserves the right to amend the program if necessary.

GUIDE TO UNDERSTANDING PAPER NUMBERING

Each paper in the technical program is assigned a unique number which indicates when the paper is presented.

The number of each paper is shown before the paper title.

Typical Paper Number: **M2P.14**

The first letter (i.e. W) indicates the day of the Conference:

M = Monday
T = Tuesday
W = Wednesday

The second number (i.e., 3) indicates what time during the day the session is being presented:

1 = Morning
2 = Afternoon

The third letter (i.e., P) indicates the type of the paper:

K = Keynote
P = Poster

The fourth number (i.e. 14) indicates the number of the paper in the session, in sequence, starting at 1. The poster numbers are also color coded by session to assist you with locating them on the floorplan.

Session 1 (M1P) LIME GREEN
Session 2 (M2P) PURPLE
Session 3 (T1P) BRIGHT BLUE
Session 4 (W1P) FUSHIA

Monday, March 26

08:30 Welcome and Introduction

Conference Co-Chairs:

Dan Huh, *University of Pennsylvania, USA*

Allen Liu, *University of Michigan, USA*

08:45 Keynote Speaker I

M1K.01 SYNTHETIC HUMAN EMBRYOLOGY IN A DISH

J. Fu

University of Michigan

KEYWORDS: Human Pluripotent Stem Cells; Human Embryology; Synthetic Human Embryology

09:45 Break

10:15 Flash Poster Session 1

Mechanobiology and Biophysics

M1P-01 DROPLET MICROFLUIDICS FOR CONSTRUCTING ARTIFICIAL CELLS

S. Majumder and A.P. Liu

University of Michigan, USA

KEYWORDS: Artificial Cell; Double Emulsion; Microfluidics; Cell-Free Expression

M1P-02 EFFECT OF THE ACTIN BINDING PROTEIN FILAMIN A (FLNA) ON CELL SHAPE AND RIGIDITY TESTING OF GLIOMA CELLS

A. Aman, M. Jun, J. Kim, and S. Park

Sungkyunkwan University, KOREA

KEYWORDS: FLNA; Traction Force; Soft Pillars; Motility

M1P-03 MECHANICAL PHENOTYPING OF ACUTE MYELOID LEUKEMIAS FOR PREDICTING RESPONSE TO RETINOIC ACID

B. Li, J. Kim, and L.L. Sohn

University of California, Berkeley, USA

KEYWORDS: Mechanical Phenotyping; Microfluidics; Acute Myeloid Leukemia

M1P-04 MICROPATTERNED ADHESIVE ISLANDS REVEAL THAT PLACENTAL TROPHOBLAST FUSION IS MECHANICALLY SENSITIVE

Z. Ma¹, R. Tran¹, L. Fagundes², S. Mok¹, C. Vaillancourt², and C. Moraes¹

¹*McGill University, CANADA* and ²*Université du Québec, CANADA*

KEYWORDS: Cell Fusion; Mechanobiology; Micropatterning; Syncytiotrophoblast

- M1P-05 INVESTIGATION OF THE ROLE OF LEUCINE ZIPPER PROTEIN 1 ON TIGHT JUNCTION USING A UNIAXIAL CELL STRETCHING DEVICE**
J. Kim¹, S. Tsukita², and S. Park¹
¹*Sungkyunkwan University, KOREA and* ²*Osaka University, JAPAN*
KEYWORDS: Cell Stretching; LUZP1; Tight Junction; Cell Monolayer
- M1P-06 PATTERNING PROTEINS USING PHOTORESIST LIFT-OFF**
A.K. Denisin¹, J. Moeller², and B.L. Pruitt¹
¹*Stanford University, USA and* ²*ETH Zurich, SWITZERLAND*
KEYWORDS: Protein Patterning; Mechanobiology; Photoresist Lift-Off; Microcontact Printing
- M1P-07 SINUSOIDAL GROOVE PATTERNED STATIC STRAIN INDUCING SYSTEM FOR EFFECTIVE DIFFERENTIATION MOUSE MYOBLAST CELLS**
B.C. Kim¹, S.J. Park², T.W. Kim¹, S.J. Han¹, and D.S. Kim¹
¹*Pohang University of Science and Technology (POSTECH), KOREA and*
²*Korea University of Technology and Education (KOREATECH), KOREA*
KEYWORDS: Static Strain; Sinusoidal Groove Pattern
- M1P-08 POLYACRYLAMIDE MICROWELLS FOR CARDIOMYOCYTE CULTURE**
R.E. Wilson, A.K. Denisin, and B.L. Pruitt
Stanford University, USA
KEYWORDS: Microwells; Cardiomyocyte; Mechanobiology; Hydrogels
- M1P-09 STUDY IN-PLANE ELASTICITIES OF ENDOTHELIAL CELLS IN DIFFERENT DIRECTIONS UNDER FLOW SHEARING USING MICROFLUIDIC DEVICES**
P.L. Ko¹, T.A. Lee¹, H.H. Hsu², C.K. Wang³, W.H. Liao¹, and Y.C. Tung¹
¹*Academia Sinica, TAIWAN,* ²*National Tsing Hua University, TAIWAN, and*
³*Tamkang University, TAIWAN*
KEYWORDS: Cell In-Plane Elasticity; Endothelial Cell; Flow Shearing; Microfluidic Device
- M1P-10 DEVELOPMENT OF MICROFLUIDIC SINGLE-CELL COMPRESSION DEVICE FOR CELL MECHANICS STUDY**
K.K.Y. Ho, Y.-L.Wang, and A.P. Liu
University of Michigan, USA
KEYWORDS: Compression, Cell Mechanics, Microfluidic Trapping, Microcontact Printing
- M1P-11 ULTRAFAST MICROFLUIDIC MECHANICAL COMPRESSION OF CELLS FOR EFFICIENT INTRACELLULAR DELIVERY OF LARGE MACROMOLECULES**
A. Liu¹, M. Islam¹, E. Waller², A. Alexeev¹, and T. Sulchek¹
¹*Georgia Institute of Technology, USA and* ²*Emory University School of Medicine, USA*
KEYWORDS: Microfluidics; Cell Deformation; Delivery; Cell Engineering
- M1P-12 ACOUSTIC TWEEZING CYTOMETRY FOR BIOMECHANICAL PHENOTYPING AND STIMULATION OF STEM CELLS**
X. Xue, Z. Fan, X. Hong, C. Deng, and J. Fu
University of Michigan, USA
KEYWORDS: Acoustic Tweezing Cytometry; Stem Cells; Mechanical Phenotyping; Mechanobiology

10:45 W1P – Poster Session 1

12:15 Lunch

13:45 Keynote Speaker II

M2K.02 THE ROLE OF PROGENITOR CELLS AND ORGANOID IN THE TRANSLATIONAL RESEARCH OF PROSTATE CANCER

S. Karkampouna¹, M. De Menna¹, F. la Manna¹, H. Jakupi¹, E. Snaar-Jagalska², L. Chen², L. Beimers³, P. Kloen⁴, O.T. Guenat¹, S. Zeinali¹, J. Grosjean¹, I. Klima¹, M. Spahn¹, G.N. Thalmann¹, and Marianna Kruithof-de Julio¹

¹University of Bern, Switzerland, ²Leiden University, NETHERLANDS, ³Slotervaart Medical Centre, NETHERLANDS, and ⁴Academic Medical Centre, NETHERLANDS

KEYWORDS: Precision Medicine, Organoids, Prostate Cancer, Microvascular on Chip, Tissue Slices

14:45 Flash Poster Session 2

Microphysical Model of Living Systems

M2P-01 3D BLOOD-BRAIN BARRIER MICROVASCULAR NETWORK MODEL INCLUDING HUMAN IPS-DERIVED ENDOTHELIAL CELLS, PERICYTES AND ASTROCYTES

M. Campisi¹, Y. Shin², T. Osaki², V. Chiono¹, and R. Kamm^{2,3}

¹Politecnico di Torino, ITALY, ²Massachusetts Institute of Technology (MIT), USA, and ³Singapore-MIT Alliance for Research & Technology, SINGAPORE

KEYWORDS: Blood Brain Barrier; Modeling; Vascular network

M2P-02 A SCAFFOLD-FREE 3D ORGANOID MODEL TO STUDY NEOPLASTIC PROGRESSION IN BREAST CANCER

S.I. Djomehri¹, C.G. Kleer¹, and S. Takayama²

¹University of Michigan, USA and ²Georgia Institute of Technology, USA

KEYWORDS: Organoid; 3D Culture; Hanging drop; Breast Cancer

M2P-03 BIOPHYSICAL MARKER-BASED 4D MICROTUMOR ANALYSIS

J. Cha and P. Kim

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

KEYWORDS: 4D Microtumor; Invasion; Biophysical Markers; Tumor Microenvironment Array Platform

M2P-04 DEVELOPMENT OF A HUMAN LUNG ALVEOLAR BARRIER BASED ON A BIOLOGICAL BASAL MEMBRANE

P. Zamprogno¹, S. Achenbach¹, J.D. Stucki¹, N. Hobi¹, N. Schneider-Daum², C.-M. Lehr², H. Huwer³, R.A. Schmid⁴, and O.T. Guenat¹

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

⁴University Hospital of Bern, SWITZERLAND

KEYWORDS: Organ-On-Chip; Bioartificial Membrane; Array of Alveoli; Human Primary Cells

- M2P-05** **ENGINEERING DASATINIB ENCAPSULATED SUB-MICROMETER POLY (LACTIC-CO-GLYCOLIC ACID) PARTICLES AGAINST PROLIFERATIVE VITREORETINOPATHY**
D.R. Chauhan, I.S.S. Balgemann, M.R. Greb, D.R. Shigeo, M.R. McDonald, D.R. Kaplan, and D.R. O Toole
University of Louisville, USA
KEYWORDS: Dasatinib; Proliferative Vitreoretinopathy; Single Emulsion; Spray Drying
- M2P-06** **CHIPS-ON-A-PLATE SYSTEM FOR VISUALIZING THE CELL MIGRATION OF AN INTESTINAL FOLLICLE-ASSOCIATED EPITHELIUM MODEL**
Y. Lee and J.-K. Park
Korea Advanced Institute of Science and Technology (KAIST), KOREA
KEYWORDS: Caco-2/Raji; Chips-on-a-Plate; Follicle-Associated Epithelium; Visualized Cell Migration
- M2P-07** **HUMAN BLINKING 'EYE-ON-A-CHIP'**
J. Seo, W.Y. Byun, F. Alisafaei, A. Georgescu, G. Massaro-Giordano, V.B. Shenoy, V. Lee, V.Y. Bunya, and D. Huh
University of Pennsylvania, USA
KEYWORDS: Organ-on-a-Chip; Biomimetics; Eye; Blinking
- M2P-08** **IN VITRO HUMAN LUNG MICROVASCULATURE-ON-CHIP FOR STUDYING ANTI-ANGIOGENIC EFFICACY OF NINTEDANIB**
S. Zeinali¹, C.A. Bichsel², N. Hobi¹, M. Funke-Chambour¹, O.T. Guenat¹, and T. Geiser¹
¹*University of Bern, SWITZERLAND and*
²*Boston Children's Hospital, Harvard Medical School, USA*
KEYWORDS: Microvasculature-on-Chip; Nintedanib; Angiogenesis; Permeability
- M2P-09** **LYMPHATIC MICROPHYSIOLOGICAL SYSTEM RECAPITULATES LYMPHATIC VASCULAR PHYSIOLOGY AND TUMOR MICROENVIRONMENTAL INTERACTIONS IN VITRO**
M.M. Gong¹, K.M. Lugo-Cintrón¹, B.R. White², P.M. Harari¹, and D.J. Beebe¹
¹*University of Wisconsin, Madison, USA and* ²*University of Wisconsin, Platteville, USA*
KEYWORDS: Lymphatic Cesset; Microphysiological System; Organotypic; Cancer
- M2P-10** **IN VITRO LUNG MICROVASCULATURE REMODELING INDUCED BY THE MECHANICAL STRESS OF THE RESPIRATION**
E.K. Thompson, S. Zeinali, T. Geiser, and O.T. Guenat
University of Bern, SWITZERLAND
KEYWORDS: 3D Cyclic Mechanical Strain; Mechanotransduction; Permeability; Morphology
- M2P-11** **MODULAR HYDROGEL STAMPS FOR MIMICKING PHYSIOLOGICAL CUES OF TISSUE MICROENVIRONMENTS**
J.J. Tokar, J.W. Warrick, G.T. Knight, B.W. Horman, M.M. Gong, R.S. Ashton, and D.J. Beebe
University of Wisconsin, Madison, USA
KEYWORDS: Gradient; Hydrogel Stamp; Agarose; Interstitial Flow

- M2P-12** **RAPID EMERGENCE OF RESISTANCE BY BREAST CANCER CELLS TO DOXORUBICIN IN CANCER RESISTANCE ACCELERATOR (CRA) CHIP**
W. Lim¹, J. Han¹, S. Kim², D. You¹, J.E. Lee^{1,2}, T.H. Shin³, G. Lee³, and S. Park¹
¹*Sungkyunkwan University, KOREA*, ²*Samsung Medical Center, KOREA*, and ³*Ajou University, KOREA*
KEYWORDS: Drug Resistance; Cancer Resistance Accelerator; Breast Cancer; Cancer Stem Cell
- M2P-13** **SENSORS EMBEDDED PLATFORM FOR ORGAN ON A CHIP**
M.A. Khalid¹, Y.S. Kim¹, K.H. Kim¹, H.B. Kim¹, S.W. Kim¹, Y.J. Cho² and K.H. Choi
¹*Jeju National University, KOREA* and ²*Seoul National University, KOREA*
KEYWORDS: Organ-on-a-Chip; Microfluidics; Drug Delivery; Embedded Sensors
- M2P-14** **STUDY PENETRATION OF PARTICULATE MATTER THROUGH BLOOD-AIR BARRIER IN VITRO USING A TRANSWELL-EMBEDDED MICROFLUIDIC DEVICE**
T.A. Lee, P.L. Ko, C.C. Peng, and Y.C. Tung
Academia Sinica, TAIWAN
KEYWORDS: Particulate Matter (PM); Blood-Air Barrier; Transwell; Microfluidics
- M2P-15** **THE DEVELOPMENT OF A 3D MICROFLUIDIC MODEL TO INVESTIGATE THE ROLE OF BBB FUNCTION IN ALZHEIMER'S DISEASE**
Y. Shin¹, S.H. Choi², E. Bylykbashi², J.A. Kim³, S. Chung⁴, and R.D. Kamm¹
¹*Massachusetts Institute of Technology (MIT), USA*, ²*Massachusetts General Hospital, USA*, ³*Korea Basic Science Institute, KOREA*, and ⁴*Korea University, KOREA*
KEYWORDS: Disease-on-a-Chip; Alzheimer's Disease (AD); Blood Brain Barrier (BBB); 3D Microfluidics
- M2P-16** **ULTRA-THIN, ALIGNED, FREE-STANDING NANOFIBER MEMBRANE FOR REAL-TIME VISUALIZATION OF LEUKOCYTE ADHESION CASCADE**
S.M. Park, S. Eom, H. Kim, K.H. Song, J. Doh, and D.S. Kim
Pohang University of Science and Technology (POSTECH), KOREA
KEYWORDS: Nanofiber Membrane; Electrospinning; Leukocyte; Adhesion Cascade
- M2P-17** **ASSESSING ANGIOGENIC POTENTIAL OF 3D TUMOUR SPHEROIDS FOR IN-VITRO CO-CULTURE MODELS**
N. Walji and E. Young
University of Toronto, CANADA
KEYWORDS: Angiogenesis; Angiogenic Potential; Tumor Spheroids; Tumor Vascularization
- M2P-18** **MINI-OPTO PLATFORM FOR VOLUMETRIC OPTICAL TOMOGRAPHIC IMAGING OF MICROPHYSIOLOGICAL SYSTEMS**
S. Hassan and Y.S. Zhang
Brigham and Womens Hospital, Harvard Medical School, USA
KEYWORDS: Optical Tomography; Imaging; Spheroids; Volumetric Imaging
- M2P-19** **COMPUTATIONAL ERROR PROPAGATION FOR SEQUENTIAL UTILIZATION OF MATHEMATICAL BIOLOGY MODELS**
H.D. Neira^{1,2} and A.E. Herr^{1,2}
¹*University of California, Berkeley/University of California, San Francisco Joint Graduate Group, USA* and ²*University of California Berkeley*
KEYWORDS: Error Propagation, Bootstrapping

15:30 **W2P – Poster Session 2** (refreshments will be served)

17:00 **Adjourn for the Day**

17:30 - **Wine & Cheese Reception**
19:00

Tuesday, March 27

08:30 Keynote Speaker III

T1K.01 ELECTROPHORETIC CYTOMETRY: PROFILING PROTEINS AND PROTEOFORMS IN SINGLE CELLS

A.E. Herr

University of California, Berkeley

KEYWORDS: Targeted Proteomics, Isoform, Microfluidic, Open Microfluidics

09:30 Flash Poster Session 3

Diagnostic and Detection Technologies

T1P-01 ACOUSTIC LEVITATION FOR MONITORING OF COAGULATION DISORDERS

V. Ansari¹, C. Brugnara², and R.G. Holt¹

¹*Boston University, USA* and ²*Boston Children's Hospital, USA*

KEYWORDS: Thromboelastography; Coagulopathy; Acoustic Levitation

T1P-02 AN INTEGRATED MICROPHOTONIC BIOSENSOR FOR SIMULTANEOUS REFRACTIVE INDEX AND DEFORMABILITY CELL DISCRIMINATION

A. Leblanc-Hotte¹, G. Chabot-Roy², S. Lesage², J.-S. Delisle², and Y.-A. Peter¹

¹*Polytechnique Montreal, CANADA* and

²*Maisonneuve-Rosemont Hospital Research Center, CANADA*

KEYWORDS: Microphotonic; Microfluidic; Fabry-Pérot; Biosensor

T1P-03 BACTERIAL PATHOGEN DETECTION USING AN OPTIMIZED SINGLE HEATER PCR MICROCHIP

R. Khnouf¹, D. Karasneh¹, and M. Jaradat^{1,2}

¹*Jordan University of Science and Technology, JORDAN* and

²*American University of Sharjah, JORDAN*

KEYWORDS: PCR; Raleigh Benard Convection; Fuzzy-PID Controller; Salmonella Entridis

T1P-04 ACOUSTIC LEVITATION: A NOVEL APPROACH TO STUDY THE PHYSICAL PROPERTIES OF BLOOD IN NORMAL SUBJECTS AND IN PATIENTS WITH SICKLE CELL DISEASE

V. Ansari¹, C. Brugnara², and R.G. Holt¹

¹*Boston University, USA* and ²*Boston Children's Hospital, USA*

KEYWORDS: Acoustic Levitation; Sickle Cell Disease; Fetal Hemoglobin; Blood Viscosity

T1P-05 BIORESORBABLE FREQUENCY-SELECTIVE MAGNESIUM MICRO-RESONATORS FABRICATED BY ION BEAM ETCHING

M. Rüegg, R. Blum, G. Boero, and J. Brugger

Ecole Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

KEYWORDS: Bioresorbable Wireless Implantable Medical Devices; Ion Beam Etching; Microwave Resonators

- T1P-06 DETECTION OF INFLUENZA ANTIGEN WITH ELECTRO-ACTIVE WAVEGUIDES**
J.H. Ghithan, M. Moreno, R.S. Keynton, M.G. O'Toole, and S.B. Mendes
University of Louisville, USA
KEYWORDS: Sensors; Guided Wave; Laser; Electrochemistry
- T1P-07 DEVELOPMENT OF A MICROFLUIDIC BIOMIMETIC DEVICE FOR TRIPLE NEGATIVE BREAST CANCER STEM CELLS EXTRAVASATION STUDIES**
A. Sivery¹, J. Duval¹, V. Senez¹, X. Le Bourhis^{1,2}, C. Lagadec^{1,2}, and A. Treizebre¹
¹University of Lille, FRANCE and ²SIRIC OncoLille, FRANCE
KEYWORDS: Cancer Stem Cell (CSC); Circulating Tumor Cells (CTC); Biomimetic Microfluidic Device; Tumor-on-Chip
- T1P-08 EXOFILTER-BASED EXOSOMAL MIRNA DETECTION OF HUMAN BLOOD PLASMA IN GASTRIC CANCER**
M. Jang
Korea Advanced Institute of Science and Technology (KAIST), KOREA
KEYWORDS: Exosome; Micro RNA; Gastric Cancer
- T1P-09 FLEXIBLE DUAL-FUNCTION PLATFORM FOR IN SITU MONITORING AND TREATMENT OF BACTERIAL BIOFILMS**
R.C. Huiszoon, P. Ramiah Rajasekaran, W.E. Bentley, and R. Ghodssi
University of Maryland, USA
KEYWORDS: Bacterial Biofilm; Bioelectric Effect; Impedance Sensor; Flexible Device
- T1P-10 NON-FOULING ENCODED HYDROGEL MICROPARTICLES FOR MULTIPLEX MIRNA PROFILING DIRECTLY FROM FFPE TISSUE**
M.B. Nagarajan¹, A.M. Tentori¹, W.C. Zhang², F.J. Slack², and P.S. Doyle¹
¹Massachusetts Institute of Technology (MIT), USA and ²Harvard Medical School, USA
KEYWORDS: miRNA; Hydrogel; Formalin-Fixed Paraffin-Embedded Tissue; Multiplexed Quantification
- T1P-11 MICROFLUIDIC DEVICE FOR MULTIPLEXED BIOMARKER SCREENING OF TISSUE MICROARRAY**
C.H. Cho and J.-K. Park
Korea Advanced Institute of Science and Technology (KAIST), KOREA
KEYWORDS: Biomarker Screening; Immunohistochemistry; Microfluidic Device; Tissue Microarray
- T1P-12 PLATINUM-IRIDIUM COATINGS FOR INCREASING SENSITIVITY OF IMPEDANCE-BASED POLYMER MICROFLUIDIC SENSORS**
A.B. Baldwin¹, C.D. Lee², A. Petrossians², J. Weiland³, and E. Meng¹
¹University of Southern California, USA, ²Platinum Group Coatings, LLC, USA, and ³University of Michigan, USA
KEYWORDS: Platinum-Iridium; Hydrocephalus; Microfluidics; Sensors
- T1P-13 SEPERATION OF SPERMATOOZA FROM ERYTHROCYTES FOR TESTICULAR BIOPSIES USING TUMBLING MECHANISM IN PINCH FLOW FRACTIONATION**
J.T.W. Berendsen, J.C.T. Eijkel, and L.I. Segerink
University of Twente, NETHERLANDS
KEYWORDS: Sperm Isolation; Pinched Flow Fractionation; Microfluidics; Erythrocytes

- T1P-14** **TiO₂ ENCAPSULATION OF INDIVIDUAL JURKAT T CELLS FOR T-CELL THERAPY**
W. Youn, H. Lee, E.H. Ko, and I.S. Choi
Korea Advanced Institute of Science and Technology (KAIST), KOREA
KEYWORDS: Artificial Spores; Cytoprotection; Immunology; Mineralization
- T1P-15** **VISUALIZATION TECHNIQUE OF PH DISTRIBUTION IN A ION DEPLETION ZONE FOR EXOSOME CONCENTRATION**
K. Mogi
Tokyo Institute of Technology, JAPAN
KEYWORDS: Ion Depletion Zone; pH; Exosome; Nafion
- T1P-16** **PH TARGETING VIA PACKAGING FOR A WIRELESS INGESTIBLE CAPSULE**
G.E. Banis, L.A. Beardslee, J. Stine, and R. Ghodssi
University of Maryland, USA
KEYWORDS: Ingestible Systems; Capsule; Capacitive Sensing; Multiplexing
- T1P-17** **ISOLATION AND CONTROLLABLE RETRIEVAL OF CIRCULATING TUMOR CELL VIA GIGAHERZ ACOUSTIC DEVICE**
Y. Yang and X. Duan
Tianjin University, CHINA
KEYWORDS: Acoustofluidics; Circulating Tumor Cell; Ultrahigh Frequency Device; Single Cell
- T1P-18** **OPTIMIZATION OF PHOTOTHERMAL EFFICIENCY OF THERMAL EVAPORATED GOLD FILM FOR MODULATING NEURAL ACTIVITY IN VITRO**
H. Kang, J.W. Lee, and Y. Nam
Korea Advanced Institute of Science and Technology (KAIST), KOREA
KEYWORDS: Photothermal Effect; Neural Interface; Microelectrode Array; Neuromodulation
- 10:15** **T1P – Poster Session 3** (refreshments will be served)
- 11:45** **Lunch**
- 13:30** **Keynote Speaker IV**
- T2K.02** **ENGINEERING WITH BIOMOLECULAR MOTORS**
H. Hess
Columbia University
KEYWORDS: Nanobiotechnology; Biomolecular Motors; Kinesin; Microtubule
- 14:30** **Break**

15:00

Young Innovator Presentations

T2Y.01

SINGLE CELL TRACKING OF COLLECTIVE MIGRATION AFTER THE EPITHELIAL-MESENCHYMAL TRANSITION

I.Y. Wong

Brown University, USA

KEYWORDS: Leader Cells; Swarming Migration; Micropillar Arrays; 3D Culture

T2Y.02

MICROPHYSIOLOGICAL SYSTEMS FOR EMULATING HUMAN TISSUES AND DISEASES

Y.S. Zhang

Brigham and Womens Hospital, Harvard Medical School, USA

16:30

Adjourn for the Day

19:00 -
21:00

Banquet

Wednesday, March 28

08:30 Keynote Speaker V

W1K.01 TOWARDS ORGANS-ON-A-PLATE AND INJECTABLE TISSUES
M. Radisic
University of Toronto

09:30 Keynote Speaker VI

W1K.02 COMMERCIALIZATION OF MICROFLUIDIC TOOLS FROM DIAGNOSTICS TO 3D CELL CULTURE
S. Chung
Korea University
KEYWORDS: Commercial Microfluidic Tools, Diagnostic, 3D Cell Culture

10:30 Break

11:00 Flash Poster Session 4

Bioassay Development / 3D Printing and Biomanufacturing

W1P-01 3D PRINTED MICROFLUIDIC PROBES
A.T. Brimmo^{1,2}, R. Alnemari², and M.A. Qasaimeh^{1,2}
¹New York University, UAE and ²New York University, USA
KEYWORDS: Microfluidic Probe; Microfluidic Quadrupole; Microfluidic Dipole

W1P-02 3D-PRINTED MICRONEEDLES FOR SKIN PENETRATION APPLICATIONS
K. Moussi and J. Kosel
King Abdullah University of Science and Technology, SAUDI ARABIA
KEYWORDS: 3D Printing; Microneedle; Skin Penetration; Microfabrication

W1P-03 A NOVEL HIGH FLOW RATE PUMPLESS MICROFLUIDIC DEVICE.
C.-H. Chuang, Z.-H. Cheng, L.-W. Wu, and Y.-Y. Chiang
National Chung-Hsing University, TAIWAN
KEYWORDS: Pumpless Microfluidics; Forward Osmosis; Draw Solution

W1P-04 ASSEMBLY OF MICROPATTERNED CELLULAR COLLAGEN SHEETS FOR BOTTOM-UP TISSUE ENGINEERING
J. Son and J.-K. Park
Korea Advanced Institute of Science and Technology (KAIST), KOREA
KEYWORDS: 3D Cell Culture; Bottom-Up Tissue Engineering; Cellular Hydrogel Sheet; Collagen

- W1P-05 ELECTROCHEMICAL STUDY OF TRAMETES VERSICOLOR LACCASE ACTIVITY ON SCREEN-PRINTED ELECTRODES**
M.S. Islam and C.K. Harnett
University of Louisville, USA
KEYWORDS: Screen-Printed Electrodes; Cyclic Voltammetry; Lab-on-Chip; Membrane Reactors
- W1P-06 ELECTROWETTING FOR BIO-PRINTING ON 3D HYDROPHOBIC ELECTRODES**
S. Chu, M.J. Lerman, J.N. Culver, J.P. Fisher, and R. Ghodssi
University of Maryland, USA
KEYWORDS: Electrowetting; Hydrophobic Materias; 3D Electrodes; Bio-Printing
- W1P-07 FABRICATION AND DEMONSTRATION OF A 3D ERROR-FREE BIO-COMPUTATION NETWORK OPERATED BY BACTERIA**
A. Sudalaiyadum Perumal¹, F.C.M. Van Delft², S. Qiu¹, and D.V. Nicolau¹
¹McGill University, CANADA and ²Nanovalk, NETHERLANDS
KEYWORDS: Bio-computation; 3D Devices; Bridges and Tunnels; Sub-Set Sum Problem; E. coli HCB437
- W1P-08 FABRICATION AND CHARACTERIZATION OF BIOPOLYMER MICRO-FIBERS FOR 3D ORIENTED MICROVASCULAR STRUCTURE BY DIRECT-WRITING TECHNIC**
X.M. Fan, P.S. Soucy, M.M. Crain, S.J. Williams, and R.S. Keynton
University of Louisville, USA
KEYWORDS: Tissue Engineering; Direct-Write; Microfibers; Endothelial Cells
- W1P-09 FABRICATION OF RANDOM/ALIGNED HYBRID NANOFIBER MAT FOR THE DEVELOPMENT OF 3D STACKED CARDIAC PATCH**
S. Eom¹, S.M. Park¹, and H.J. Park²
¹Pohang University of Science and Technology (POSTECH), KOREA and ²Catholic University of Korea, KOREA
KEYWORDS: Hybrid; Nanofiber; Cardiac Patch
- W1P-10 MICROFLUIDICS WITHIN A WELL: INJECTION-MOLDED PLASTIC ARRAY 3D CULTURE TISSUE PLATFORM**
Y.G. Lee, J.W. Choi, D.H. Park, S.M. Lee, J.H. Ko, and J. Yu
Seoul National University, KOREA
KEYWORDS: Organ-on-a-Chip; Cell Patterning; Capillary Wetting; 3D Culture
- W1P-11 MICROFRET – MINIATURIZING KINASE ASSAYS FOR DRUG DISCOVERY**
M. Schappert¹, B. Seashore-Ludlow², and H. Joensson¹
¹Royal Institute of Technology, SWEDEN and ²Karolinska Institute, SWEDEN
KEYWORDS: Drug Discovery; Microfluidic Droplets; FRET; Tyrosine Kinase Inhibition
- W1P-12 IMPROVED ELECTROSPRAYING PROCESS TO FABRICATE HIERARCHICAL MICRO/NANO STRUCTURE ON AN INSULATOR**
S.J. Lee, S.M. Park, and S.J. Han
Pohang University of Science and Technology (POSTECH), KOREA
KEYWORDS: Electrospaying; Electrolyte Solution; Hierarchical Micro Nano Structure

- W1P-13 PRECLINICAL MODELS OF PRECISION MEDICINE IN PROSTATE CANCER**
M. De Menna¹, S. Karkampuona¹, F. Ia Manna¹, H. Jakupi¹, E. Snaar-Jagalska²,
L. Chen², L. Beimers³, P. Kloen⁴, O. Guenat¹, S. Zeinali¹, J. Grosejan¹, and I. Klima¹
¹University of Bern, SWITZERLAND, ²Leiden University, NETHERLANDS,
³Slotervaart Medical Centre, NETHERLANDS, and
⁴Academic Medical Centre, NETHERLANDS
KEYWORDS: Prostate Cancer; Precision Medicine
- W1P-14 SMALL RNA EXTRACTION AND PURIFICATION FROM BULK CELL-LYSATE USING ISOTACHOPHORESIS**
R. Khnouf^{1,2}, C.M. Han³, S. Munro³, and J.G. Santiago²
¹Jordan University of Science and Technology, JORDAN, ²Stanford University, USA,
and ³National Institute of Standards and Technology (NIST), USA
KEYWORDS: Isotachophoresis; Small RNA; Microfluidic Device; RT-QOQR
- W1P-15 POROUS SUB-MICROMETER PDMS MEMBRANES AS CELL CULTURE SUBSTRATES IN A MICROFLUIDIC CHIP**
M.P. Tibbe, H. Le-The, A.M. Leferink, J.C.T. Eijkel, and L.I. Segerink
University of Twente, NETHERLANDS
KEYWORDS: Polydimethylsiloxane Membrane; Cell Culture; Microfluidic Chip
- W1P-16 INVESTIGATING THE IMPACT OF PROBE SIZE ON IN-GEL IMMUNOASSAYS**
Alison Su and Amy E. Herr
University of California, Berkeley/University of California,
San Francisco Graduate Program
KEYWORDS: Thermodynamic Partitioning, In-Gel Immunoassay, Antigen-Binding Fragments
- W1P-17 FLOW THROUGH GELS AS A TOOL TO GENERATE 3D CONCENTRATION PROFILES IN HYDROGEL-FILLED DEVICES**
J. Loessberg-Zahl, A. van der Meer, A. van den Berg, and J.C.T. Eijkel
University of Twente, NETHERLANDS
KEYWORDS: Flow Patterning; Hydrogel; 3D-Printing
- W1P-18 FUNCTIONALIZING POLYACRYLAMIDE GELS FOR RAPID CAPTURE AND RELEASE OF OLIGONUCLEOTIDES**
Y. Zhang¹, P.P.Y. Chan^{1,2}, and A.E. Herr¹
¹University of California, Berkeley, USA and
²Swinburne University of Technology, AUSTRALIA
KEYWORDS: Copolymerization, Functional Hydrogels, Oligonucleotides,
Reversible Immobilization
- W1P-19 DEVELOPMENT OF ON-CHIP KIDNEY TUBULE MODEL INTEGRATED WITH TRANS-EPITHELIAL ELECTRICAL RESISTANCE SYSTEM**
Y. Tanaka and H. Kimura
Tokai University, JAPAN
KEYWORDS: Organ-on-a-Chip; Kidney Tubule; Trans-Epithelial Electrical Resistance;
Drug Discovery

**W1P-20 INVESTIGATING THE IMPACT OF DENATURING DETERGENTS ON
PROTEIN-HYDROGEL SYSTEMS**

A. Gopal and A.E. Herr

University of California, Berkeley, USA

KEYWORDS: Immunoassays, Multiplexing, Hydrogels

11:45 W1P – Poster Session 4

13:15 Award Ceremony and Closing Remarks

13:30 Conference Adjourns