Executive Committee reserves the right to amend the program if necessary.
Sunday 27 October

13:00 - 17:00  Workshop & Short Courses
17:00 - 19:00  Conference Registration and Check-In
17:00 - 19:00  Welcome Reception

Monday 28 October

07:00 - 18:00  Registration
08:30 - 08:45  Opening Remarks
08:45 - 09:30  Plenary Presentation I
  BIOLOGY AT THE NANOSCALE, ONE MOLECULE AT A TIME
  Antoine M. van Oijen
  University of Groningen, THE NETHERLANDS

Session 1A1 - Tools for Single Molecule Manipulation

09:45 - 10:05  NANOFLUIDIC DEVICE ARCHITECTURES FOR THE CONTROLLED TRANSPORT AND HIGH THROUGHPUT ANALYSIS OF SINGLE DNA MOLECULES IN NANOCANALS
  L.D. Menard and J.M. Ramsey
  University of North Carolina, USA

10:05 - 10:25  WHAT DO PHOTONS DO TO FLUORESCENTLY STAINED DNA IN CONFINEMENT?
  J.P. Beech\textsuperscript{1}, L. Nyberg\textsuperscript{2}, J. Fritzsche\textsuperscript{2}, F. Westerlund\textsuperscript{2}, and J.O. Tegenfeldt\textsuperscript{1}
  \textsuperscript{1}Lund University, SWEDEN and \textsuperscript{2}Chalmers University, SWEDEN

10:25 - 10:45  MICROFLUIDIC PARALLEL STRETCHING AND STAMPING OF SINGLE DNA MOLECULES FOR SUPER RESOLUTION MICROSCOPE IMAGING
  H. Yasaki\textsuperscript{1}, D. Onoshima\textsuperscript{1}, T. Yasui\textsuperscript{1}, T. Naito\textsuperscript{2}, N. Kaji\textsuperscript{1}, and Y. Baba\textsuperscript{1,3}
  \textsuperscript{1}Nagoya University, JAPAN, \textsuperscript{2}Kyoto University, JAPAN, and
  \textsuperscript{3}National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

Session 1B1 - Chemical and Electrochemical Sensing

09:45 - 10:05  PHASE 1 AND 2 DRUG METABOLITES GENERATED USING A MINIATURIZED ELECTROCHEMICAL CELL WITH AN ATTACHED ESI NEEDLE
  F. van den Brink\textsuperscript{1}, L. Bütter\textsuperscript{2}, M. Odijk\textsuperscript{1}, W. Olthuis\textsuperscript{1}, U. Karst\textsuperscript{2}, and A. van den Berg\textsuperscript{1}
  \textsuperscript{1}MESA+, University of Twente, THE NETHERLANDS and \textsuperscript{2}University of Münster, GERMANY

10:05 - 10:25  SELF-POWERED MOBILE SENSOR FOR IN-PIPE POTABLE WATER QUALITY MONITORING
  R. Wu\textsuperscript{1}, W.W.A. Wan Salim\textsuperscript{1}, S. Malhotra\textsuperscript{1}, A. Brovont\textsuperscript{1}, J.H. Park\textsuperscript{1}, S.D. Pekarek\textsuperscript{1}, M.K. Banks\textsuperscript{2}, and D.M. Porterfield\textsuperscript{1,3}
  \textsuperscript{1}Purdue University, USA, \textsuperscript{2}Texas A&M University, USA, and \textsuperscript{3}NASA Life and Physical Sciences, USA

10:25 - 10:45  TIME CAPSULE: A DIFFUSION-REACTION BASED PASSIVE SENSING SYSTEM WITH TIMING AND RECORDING FUNCTIONS
  Y. Chen and S.K.Y. Tang
  Stanford University, USA
Session 1C1 - Circulating Tumor Cells

09:45 - 10:05
PARALLELIZED MICROFLUIDIC IMMUNOCAPTURE OF CIRCULATING PANCREATIC CELLS FOR GENETIC ANALYSIS AND EARLY DETECTION OF PANCREATIC CARCINOGENESIS
F.I. Thege¹, S.M. Santana¹, T.B. Lannin¹, S. Tsai², T.N. Saha², M.E. Godla¹, E.D. Pratt¹, A.D. Rhim²,³, and B.J. Kirby¹
¹Cornell University, USA, ²University of Pennsylvania, USA, and ³University of Michigan, USA

10:05 - 10:25
HIGH THROUGHPUT CIRCULATING TUMOR CELL ISOLATION USING TRAPEZOIDAL INERTIAL MICROFLUIDICS
G. Guan²,³, M.E. Warkiani¹, K.B. Luan², C.T. Lim¹,², P.C.Y. Chen¹,², and J. Han¹,³
¹Singapore-MIT Alliance for Research and Technology (SMART), SINGAPORE, ²National University of Singapore, SINGAPORE, and ³Massachusetts Institute of Technology, USA

10:25 - 10:45
TUNEABLE "NANOSHEARING": AN INNOVATIVE MECHANISM FOR THE ACCURATE AND SPECIFIC CAPTURE OF RARE CANCER CELLS
M.J.A. Shiddiky, R. Vaidyanathan, S. Rauf, Z. Tay, and M. Trau
University of Queensland, AUSTRALIA

10:45 - 11:15
Break and Exhibit Inspection

Session 1A2 - Single Molecule Characterization

11:15 - 11:35
DNA METHYLATION MAPPING IN NANOSLIT DEVICES AT A SINGLE MOLECULE LEVEL
M. Mizutani¹, T. Yasui¹, N. Kaji¹, S. Rahong², T. Yanagida³, M. Kanai³, K. Nagashima³, T. Kawai³, and Y. Baba¹,³
¹Nagoya University, JAPAN, ²Osaka University, JAPAN, and ³National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

11:35 - 11:55
SINGLE-STRANDED DNA DETECTION VIA CHEMICALLY MODIFIED ALAMETHICIN NANOPORE AT SINGLE MOLECULE LEVEL
R. Kawano¹, D. Noshiro², T. Osaki¹,³, K. Kamiya¹, K. Asami², S. Futaki², S. Takeuchi¹,³
¹Kanagawa Academy of Science and Technology (KAST), JAPAN, ²Kyoto University, and ³University of Tokyo, JAPAN

11:55 - 12:15
SINGLE MOLECULE HYDRODYNAMIC SEPARATION FOR ULTRASENSITIVE AND QUANTITATIVE DNA SIZE SEPARATIONS
S.M. Friedrich, K.J. Liu, and T.H. Wang
Johns Hopkins University, USA

Session 1B2 - Particle Processing

11:15 - 11:35
MICROFABRICATED MAGNETIC POTENTIAL WELL ARRAYS AND MECHATRONIC SYSTEM FOR JOYSTICK-BASED MASSIVELY PARALLEL MANIPULATION OF MAGNETIC PARTICLES
C. Murray, J. Kong, P. Tseng, and D. Di Carlo
University of California, Los Angeles, USA

11:35 - 11:55
TWO-DIMENSIONAL ACOUSTOPHORESIS IN SQUARE MICROCHANNEL ENABLES SUB-MICROMETER PARTICLE FOCUSING
M. Nordin¹, P. Augustsson¹, P. Barkholt Muller², and H. Bruus², T. Laurell¹
¹Lund University, SWEDEN and ²Technical University of Denmark, DENMARK

11:55 - 12:15
DEVELOPMENT OF MICROFLUIDIC DEVICES WITH THE POLYETHYLENE GLYCOL-LIPID-MODIFIED ADSORPTION SURFACE FOR HIGH-THROUGHPUT ISOLATION OF EXOSOMES FROM HUMAN SERUM
M. Kobayashi¹, M. Sasaki¹, N. Kosaka², T. Ochiya², T. Akagi¹, and T. Ichiki¹
¹University of Tokyo, JAPAN and ²National Cancer Research Institute, JAPAN
Session 1C2 - Screening Platforms

11:15 - 11:35  MICRODEVICE TO ASSESS THE EFFECT OF LINEAR WNT-3A GRADIENT ON COLONIC CRYPTS
A.A. Ahmad1,2, Y. Wang1, P.K. Shah1,2, C.E. Sims1, S.T. Magness1, and N.L. Allbritton1,2
1University of North Carolina, USA and 2North Carolina State University, USA

11:35 - 11:55  SHORT-RANGE PARACRINE INTERACTIONS REVEALED IN A COMPARTMENTALIZED CO-CULTURE SCREENING PLATFORM
K.H. Spencer and E.E. Hui
University of California, Irvine, USA

11:55 - 12:15  A MICROPATTERNED HUMAN EMBRYONIC STEM CELL MODEL FOR IN VITRO HUMAN DEVELOPMENTAL TOXICITY TESTING
Y.-C. Toh1, J. Xing1,2, S. Xu2,3, and H. Yu1,2,3
1Institute of Bioengineering and Nanotechnology, SINGAPORE, 2National University of Singapore, SINGAPORE, and 3Singapore-MIT Alliance for Research and Technology (SMART), SINGAPORE

12:15 - 13:15  Lunch

13:15 - 14:00  Plenary Presentation II
Stephen C. Jacobson
Indiana University, USA

14:00 - 16:00  Poster Session 1

Fundamentals in Microfluidics and Nanofluidics

Wetting, Capillarity, Priming

M.001a  IS THERMOCAPILLARY ENOUGH FOR DROPLET ACTUATION?
A. Davanlou, R. Shabani, H.J. Cho, and R. Kumar
University of Central Florida, USA

Electrokinetic Phenomena

M.002a  DUAL FUNCTION MICROFLUIDIC PUMP AND PARTICLE FILTER USING TRAVELING-WAVE ELECTROOSMOSIS AND DIELECTROPHORESIS
Y.-L. Sung1, S.-C. Lin1, W.-Y. Chuang1, Y.-C. Tung2, and C.-T. Lin1
1National Taiwan University, TAIWAN and 2Academia Sinica, TAIWAN

M.003a  PDMS VALVES AS TUNABLE NANOCHANNELS FOR CONCENTRATION POLARIZATION
J. Quist, S.J. Trietsch, P. Vulto, and T. Hankemeier
Leiden University, THE NETHERLANDS

Droplets & Plugs, Multiphase Systems

M.004a  A SINGLE PARTICLE ENCAPSULATION WITHIN DROPLET IN ARRAY- BASED MICROFLUIDIC PLATFORM
H. Lee, L. Xu and K.W. Oh
University of Buffalo, State University of New York, USA

M.005a  BUBBLE PINCH-OFF AND BREAKUP DUE TO INSTABILITY IN MICRO-JETTTHING
S. Xiong1, T. Tandiono2, C.D. Ohl1, and A.Q. Liu1
1Nanyang Technological University, SINGAPORE and 2Institute of High Performance Computing, A*STAR, SINGAPORE
FORMATION OF PRESSURE DRIVEN PARALLEL AQU/ORG TWO PHASE FLOW IN EXTENDED-NANO SPACE BY A FIB-BASED PARTIAL HYDROPHOBIC MODIFICATION METHOD
T. Ugajin, Y. Kazoe, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN

MASS TRANSPORT IN EMULSION STUDIED IN A ONE-DIMENSIONAL MICROARRAY
P. Gruner¹, B. Semin², J. Lim³, and J.C. Baret¹
¹Max-Planck-Institute for Dynamics and Self-Organization, GERMANY and ²Laboratoire de Physique Statistique, FRANCE

ON-DEMAND CONTROL OF PH IN MICROFLUIDIC DROPLETS
H.B. Zhou¹² and S.H. Yao¹
¹Hong Kong University of Science & Technology, CHINA and ²Chinese Academy of Science, CHINA

PRODUCTION OF MONODISPERSE BULK EMULSIONS IN A BEAKER USING A NOVEL MICROFLUIDIC DEVICE
R. Dangla and C.N. Baroud
Ecole Polytechnique, FRANCE

TUNABLE FABRICATION OF MICROFLUIDIC EMULSIONS BY SPINODAL DECOMPOSITION
S.K. Yap¹, A.Z.M. Badruddoza¹, and S.A. Khan¹²
¹National University of Singapore, SINGAPORE and ²Singapore-MIT Alliance for Research and Technology (SMART), SINGAPORE

DISTINCTIVE LIGHTWAVE COUPLING IN OPTOFLUIDIC PARALLEL WAVEGUIDES FOR SINGLE MOLECULE SORTING
L.K. Chin, Y. Yang, L. Lei, and A.Q. Liu
Nanyang Technological University, SINGAPORE

LOCALIZED SURFACE PLASMON RESONANCE (LSPR) OPTOFLUIDIC BIOSENSOR FOR LABEL-FREE CELLULAR IMMUNOPHENOTYPING
B.-R. Oh¹, N.-T. Huang¹, W. Chen¹, J. Seo², J. Fu¹, and K. Kurabayashi¹
¹University of Michigan, USA and ²Hongik University, SOUTH KOREA

OPTICAL MANIPULATION OF MICROPARTICLES IN OPTOFLUIDIC WAVEGUIDES
Y.Z. Shi¹, Y. Yang², and A.Q. Liu¹²
¹Xi’an Jiao Tong University, CHINA and ²Nanyang Technological University, SINGAPORE

MANIPULATION OF MAGNETIC PARTICLES IN µ-FLUIDIC VOLUMES
Y. Gao¹², A. van Reenen¹², M.A. Hulsen¹, A.M. de Jong¹, M.W.J. Prins¹, and J.M.J. den Toonder¹
¹Eindhoven University of Technology, THE NETHERLANDS and ²Philips Research, THE NETHERLANDS

CONTROL OF BLOOD’S RHEOLOGICAL PROPERTIES USING SURFACE ACOUSTIC WAVES
M.A. Khalid, J. Reboud, R. Wilson, and J.M. Cooper
University of Glasgow, UK
Nanofluidic Phenomena (Nanochannels, -Tubes & -Pores)

M.016a
A PARTICLE TRACKING VELOCIMETRY FOR EXTENDED NANOCHANNEL FLOWS USING EVANESCENT WAVE ILLUMINATION
Y. Kazoe, K. Iseki, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN

M.017a
MOLECULAR CAPTURE IN EXTENDED NANOCHANNELS FOR FEMTO LITER SCALE IMMUNOASSAY
K. Shirai1, K. Mawatari1,2, and T. Kitamori1,2
1University of Tokyo and 2Japan Science and Technology Agency (JST), JAPAN

M.018a
SIZE-BASED PROTEIN FRACTIONATION IN NANOFLUIDIC CHANNEL ARRAYS
A.T. Woolley, S. Kumar, J. Xuan, M.L. Lee, H.D. Tolley, and A.R. Hawkins
Brigham Young University, USA

Others
M.019a
ON-CHIP ELECTROPORATION DEVICE FOR DIRECT INTRODUCTION OF PLASMIDS INTO CELL NUCLEUS AND OBSERVATION OF CELL REPROGRAMMING PROCESS
K.O. Okeyo1, Y. Hayashi1, O. Kurosawa1, H. Oana1, H. Kotera2, and M. Washizu1
1University of Tokyo, JAPAN and 2Kyoto University, JAPAN

Micro- and Nanoengineering

Micro- & Nanofabrication/ -Patterning/ -Integration

M.020b
A FLOW-THROUGH MICROARRAY OF PREFORMED POROUS POLYMER MONOLITHS IN A THERMOPLASTIC MICROFLUIDIC CHIP
E.L. Kendall, E. Wienhold, O. Rahmanian, and D.L. DeVoe
University of Maryland, College Park, USA

M.021b
ARBITRARY NANOPATTERNING INSIDE NANOCHANNELS BY INTEGRATION OF TOP-DOWN AND BOTTOM-UP APPROACHES FOR SINGLE MOLECULE ANALYSIS
N. Matsumoto and Y. Xu
Osaka Prefecture University, JAPAN

M.022b
EFFECT OF AFFINITY BETWEEN THE STAMP AND INK MOLECULES ON MICRO CONTACT PRINTING
T. Inaba, T. Jean, and N. Miki
Keio University, JAPAN

M.023b
FLUID FLOW THROUGH CARBON NANOTUBE FOREST MICROCHANNELS
K.B. Teichert1 and A.J. Hart1,2
1University of Michigan, USA and 2Massachusetts Institute of Technology, USA

M.024b
MICRO- AND NANOSTRUCTURED MICROFLUIDIC CHIP FOR SPECIFIC PROTEIN IMMOBILIZATION
N.E. Steidle1, T. Hahn2, C. Bader1, M. Schneider1, R. Ahrens1, M. Worgull1, and A.E. Guber1
1Karlsruhe Institute of Technology, GERMANY and 2Bürkert Fluid Control Systems GmbH & Co. KG, GERMANY

M.025b
ONE-STEP MICROARRAY FABRICATION OF UV-PHOTOPRINTABLE IONOGELS FOR BIOMOLECULE IMMOBILIZATION ON NON-MODIFIED COP AND COC MICROFLUIDIC CHIPS
M. Tijero1,2, F. Benito-López1, R. Diez-Ahedo1,2, L. Basabe-Desmonts1,2, and V. Castro-López1
1CIC microGUNE, SPAIN, 2IK4-IKERLAN, SPAIN, 3IK4-TEKNIKER, SPAIN, and 4IKERBASQUE, SPAIN
M.026b
RAPID FABRICATION OF OSTE+ MICROFLUIDIC DEVICES WITH LITHOGRAPHICALLY DEFINED HYDROPHOBIC/HYDROPHILIC PATTERNS AND BIOCOMPATIBLE CHIP SEALING
X. Zhou, F. Calborg, N. Sandström, A. Haleem, A. Vastesson, F. Saharil, W. van der Wijngaart, and T. Haraldsson
Royal Institute of Technology (KTH), SWEDEN

M.027b
SELF-ROLLED POLY(DIMETHYL SILOXANE) MICROCAPILLARIES WITH ENGINEERED INNER SURFACE: NEW FUNCTIONAL ELEMENTS OF MICROFLUIDIC DEVICES
L.P.C. Gomez1, P. Bollgruen2, A. Egunov3, D. Mager2, F. Malloggi4, J.G. Korvink2, and V. Luchnikov3
1Universidad Nacional de Colombia Bogota, COLOMBIA, 2Freiburg Institute for Advanced Studies (FRIAS), GERMANY, 3Institut de Science des Matériaux de Mulhouse, FRANCE, and 4Laboratoire Interdisciplinaire sur l’Organisation Nanométrique et Supramoléculaire (CEA/CNRS), FRANCE

M.028b
THREE-DIMENSIONAL FABRICATION OF LONG AND HETEROGENEOUS MICROSTRUCTURES USING VERTICAL CONTINUOUS FLOW LITHOGRAPHY
S. Habasaki1, S. Yoshida1, W.C. Lee1,2, and S. Takeuchi1,2
1University of Tokyo, JAPAN and 2Japan Science and Technology Agency (JST), JAPAN

Novel/Smart/Responsive Materials

M.029b
BIOCOMPATIBILITY OF OSTE POLYMERS STUDIED BY CELL GROWTH EXPERIMENTS
C. Errando-Herranz1,2, A. Vastesson1,3, M. Zelenina1, G. Pardon1, G. Bergström2, W. van der Wijngaart1, T. Haraldsson1, H. Brismar1, and K.B. Gylfason1
1Royal Institute of Technology (KTH), SWEDEN, 2Universidad Politécnica de Valencia, SPAIN, and 3Linköping University, SWEDEN

M.030b
MAGNETOPHORETIC MANIPULATION IN MICROSYSTEM USING I-PDMS MICROSTRUCTURES
Institut des Nanotechnologies de Lyon, FRANCE

M.031b
PHOTO-CLEAVABLE CROSSLINKER CAPABLE OF PREPARING PHOTODEGRADABLE HYDROGEL BY A TWO COMPONENT REACTION FOR HYDROGEL MICRO PATTERNING
F. Yanagawa, S. Sugiura, T. Takagi, K. Sumaru, and T. Kanamori
National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

Surface Modification

M.033b
LOCAL SURFACE MODIFICATION AT THE MICROSCALE ENABLED BY LIQUID DIELECTROPHORESIS TECHNOLOGY
R. Renaudot1, T. Nguyen1, Y. Fouillet1, L. Jalabert2, M. Kumesnara2, D. Collard2, H. Fujita2, and V. Agache1
1Commissariat à l’énergie atomique (CEA), FRANCE and 2University of Tokyo, JAPAN

M.034b
SUPERHYDROPHILIC TRAP-BASED SELF-PATTERNING OF LIQUID ON CO2 LASER TREATED GLASS SURFACE
K. Xu, J.P. Landers
University of Virginia, USA
**Molecular Systems & Nanochemistry**

**M.035b**  
**MICROTUBULE MANIPULATION BY AN ELECTRIC FIELD IN A FUSED SILICA CHANNEL**  
T. Nakahara¹, N. Isozaki¹, S. Ando¹, N.K. Kamisetty¹, H. Shintaku¹, H. Kotera¹, and R. Yokokawa¹,²  
¹Kyoto University, JAPAN and ²Japan Science and Technology Agency (JST), JAPAN

**Nanobiotechnology**

**M.036b**  
**CHRISTMAS-TREE NANOWIRE CHIPS FOR DNA SEPARATION**  
S. Rahong¹, T. Yasui², T. Yanagida¹, M. Kanai¹, K. Nagashima¹, A. Klamchuen¹,³, M. Gang¹, H. Yong¹, F. Zhuge¹, N. Kaji², Y. Baba²,³, and T. Kawai¹  
¹Osaka University, JAPAN, ²Nagoya University, JAPAN, ³Nanotec, THAILAND and  
⁴National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

**M.037b**  
**HIGHLY SENSITIVE DETECTION OF DNA WITH HNA DEFINED SILICON NANOWIRE FET**  
L. Dong and X.M. Yu  
Peking University, CHINA

**M.038b**  
**SENSITIVE AND FAST DNA QUANTIFICATION OF DNA ON FILTER PAPER VIA NANOPIRICLE AGGREGATION**  
Q. Liu, D.L. Green, and J.P. Landers  
University of Virginia, USA

**Nanoassembly**

**M.039b**  
**SELF-ASSEMBLED NANOWIRES ON GRAPHENE IN MICROFLUIDIC CHANNELS**  
W.C. Lee¹,², J. Park¹, K. Kim²,³, A. Zettl³,⁴, D.A. Weitz³, and S. Takeuchi¹  
¹University of Tokyo, JAPAN, ²Japan Science and Technology Agency (JST), JAPAN, ³Harvard University, USA,  
⁴University of California, Berkeley, USA, and ⁵Lawrence Berkeley National Laboratory, USA

**Sensors & Actuators, Detection Technologies**

**Micropumps, -Valves, -Dispensers**

**M.040c**  
**A MICROFUIDICS BASED 3D BIOPRINTER WITH ON-THE-FLY MULTIMATERIAL SWITCHING CAPABILITY**  
S.T. Beyer, T. Mohamed, and K. Walus  
University of British Columbia, CANADA

**M.041c**  
**RATE-SWITCHABLE AND PRECISELY-TIMED OSMOTIC PUMPING ON A CHIP**  
P.-J. Peng, J.-J. Wang, and Y.-C. Su  
National Tsing Hua University, TAIWAN

**M.042c**  
**VALVELESS FLUID ACTUATION: LIEBAU’S PRINCIPLE FULLY INTEGRATED ON THE MICROFLUIDIC SCALE**  
L. Bogunovic¹, S. Gerkens¹, M. Viehues¹, J. Regtmeier¹, R. Eichhorn²,³, and D. Anselmetti¹  
¹Bielefeld University, GERMANY, ²Royal Institute of Technology (KTH), SWEDEN, and ³Stockholm University, SWEDEN
Physical Sensors

M.043c
A NOVEL CAPACITIVE DEW-POINT SENSING APPROACH BASED ON WATER-ACTUATED SWELLING OF A SENSING POLYMER MONOLAYER
V. Kondrashov, J.-N. Schönberg, and J. Rühe
University of Freiburg - IMTEK, GERMANY

M.044c
RESOLUTION ENHANCEMENT OF SUSPENDED MICROCHANNEL RESONATORS BY MASS CORRELATION ANALYSIS
M.M. Modena, Y. Wang, and T.P. Burg
MPI for Biophysical Chemistry, GERMANY

Biosensors

M.045c
A CAPILLARY-DRIVEN MICROFLUIDIC DEVICE FOR RAPID DNA DETECTION WITH EXTREMELY LOW SAMPLE CONSUMPTION
C. Huang, B.J. Jones, M. Bivragh, K. Jans, L. Lagae, and P. Peumans
IMEC, BELGIUM

M.046c
A NEW DISCRIMINATION METHOD OF TARGET BIOMOLECULES WITH MINIATURIZED SENSOR ARRAY UTILIZING LIPOSOME ENCAPSULATING FLUORESCENT MOLECULES WITH TIME COURSE ANALYSIS
K. Takada1, T. Fujimoto1, T. Shimanouchi2, M. Fukuzawa1, K. Yamashita1, H. Umakoshi3, and M. Noda1
1Kyoto Institute of Technology, JAPAN, 2Okayama University, JAPAN, and 3Osaka University, JAPAN

M.047c
AC-ELECTROOSMOSIS-ASSISTED HIGH-DENSITY SIMUTANEOUS ASSEMBLY OF SERS NANOPARTICLES AND BIOMOLECULES FOR RAPID BIO-DETECTION
C.W. Lee1 and F.-G. Tseng1,2
1Tsing Hua University, TAIWAN and 2Academia Sinica, TAIWAN

M.048c
AN INTEGRATED MICROSYSTEM FOR BACTERIAL BIOFILM DETECTION AND TREATMENT
Y.W. Kim, M.T. Meyer, A. Berkovich, A.A. Iliadis, W.E. Bentley, and R. Ghodssi
University of Maryland, College Park, USA

M.049c
CANCER SENSORS BASED ON GRAPHENE AND GRAPHENE COMPOSITES
B. Zhang, and T. Cui
University of Minnesota, USA

M.050c
DEVELOPMENT OF LABEL-FREE BIOSENSOR BASED ON APTAMER-MODIFIED SI NANOWIRE FIELD EFFECT TRANSISTOR (FET) USING TOP-DOWN APPROACH AND SOL-GEL METHOD
1Seoul National University of Science & Technology, SOUTH KOREA, 2Korea Electronics Technology Institute, SOUTH KOREA, 3PCL Inc, SOUTH KOREA, 4Dongguk University, SOUTH KOREA, and 5Seoul Techno Park Microsystems Packaging Support Center, SOUTH KOREA

M.051c
DYNAMIC MAGNETIC PARTICLE ACTUATION FOR RAPID BIOSENSING
A. van Reenen1, Y. Gao1, A.M. de Jong1, M.A. Hulsen1, J.M.J. den Toonder1, and M.W.J. Prins1,2
1Eindhoven University of Technology, THE NETHERLANDS and 2Philips Research, THE NETHERLANDS
M.052c
IMMOBILIZATION OF BIOLOGICAL ACTIVE MOLECULES ON CHEMICALLY INERT POLYMER CHIPS
FOR BIO-ANALYTICAL DETECTION
N. Hlawatsch, M. Krumbholz, J. Rommel, H. Becker, and C. Gärtner
Microfluidic ChipShop GmbH, GERMANY

M.053c
MEASURING BINDING INTERACTIONS OF NEURITE-EXTENSION PROMOTING ANTIBODIES TO
SUPPORTED LIPID MEMBRANES USING A MULTICHANNEL MICROFLUIDIC PLASMONIC NANOHOLE
ARRAY BIOSENSOR
L. Jordan¹, X. Xu², N.J. Wittenberg¹, A.E. Warrington², A. Denic², B. Wootla², D. Yoo¹, J. Watzlawik²,
M. Rodriguez², and S.-H. Oh¹
¹University of Minnesota, USA and ²Mayo Clinic College of Medicine, USA

M.054c
MONOLITH IMMUNO-SPOTTING MULTIPLEX IMMUNOSENSORS IN A MICROFLUIDIC DEVICE
O. Rahmanian and D.L. DeVoe
University of Maryland, College Park, USA

M.055c
NANO-CEC CHIP WITH EFFECTIVE SEQUENTIAL ELECTRICAL CONCENTRATION FOR HIGH
SENSITIVE CONTINUOUS ANALYSIS OF BIOCHEMICALS RELEASED BY SINGLE CELLS
P.-J. Wang, R.-G. Wu, F.-G. Tseng, and Y.-L. Wang
National Tsing Hua University, TAIWAN

M.056c
OXYGEN CONSUMPTION MONITORING OF SINGLE ZEBRAFISH EMBRYONIC DEVELOPMENT WITHIN
A MICROWELL DEVICE BASED ON PHASE-BASED PHOSPHORESCENCE LIFETIME DETECTION
S.H. Huang and K.S. Huang
National Taiwan Ocean University, TAIWAN

M.057c
RAPID, LOW-COST DETECTION OF PATHOGENIC BACTERIA FOR POINT-OF-CARE DIAGNOSTICS
G. Ongo, V. Laforte, and D. Juncker
McGill University, CANADA

M.058c
SUB-SECOND DETERMINATION OF BIOGENIC PROTEIN POLYMERIZATION ACTIVITY USING FLOW
INDUCED REFRACTIVE INDEX “VALLEY”
S. Inoue, K. Hayashi, Y. Iwasaki, T. Horiuchi, N. Matsuura, and Y. Sato
Nippon Telegraph and Telephone Corporation, JAPAN

Chemical & Electrochemical Sensors

M.059c
DEVELOPMENT OF ON-CHIP SOLID PHASE EXTRACTION (SPE) WITH PRECISE FLOW-CONTROL BY
MICROPUMP FOR HIGHLY SENSITIVE LIQUID ELECTRODE PLASMA
D.V. Khoai¹, T. Yamamoto¹, Y. Ukita¹, and Y. Takamura¹
¹Japan Advanced Institute of Science and Technology (JAIST), JAPAN and ²Micro Emission Ltd., JAPAN

M.060c
A PORTABLE LAB-ON-A-CHIP INSTRUMENT BASED ON MICROCHIP ELECTROPHORESIS WITH
CONTACTLESS CONDUCTIVITY DETECTOR WITH REPLACEABLE DETECTION CELL FOR
ORNAMENTAL FISH FARMS APPLICATION
K. Ansari¹, J.Y.S. Ying¹, P.C. Hauser², and N.F. de Rooij³
¹Agency for Science, Technology and Research (A*STAR), SINGAPORE, ²Universität Basel, SWITZERLAND, and
³Université de Neuchâtel, SWITZERLAND
M.061c
NANOPARTICLES-BASED ELECTROCHEMICAL BIOSENSOR FOR SINGLE BACTERIUM DETECTION BY REDOX SIGNAL AMPLIFICATION
C.S. Lu¹, P.C. Wen¹, H.Y. Chang¹, and F.G. Tseng¹,²
¹National Tsing Hua University, TAIWAN and ²Research Center for Applied Sciences, TAIWAN

M.062c
ENZYME FREE GLUCOSE SENSOR BASED ON MICRO-NANO DUALPOROUS GOLD MODIFIED SCREEN PRINTED CARBON ELECTRODE
X.V. Nguyen¹,², M. Chikae¹, Y. Ukit¹, and Y. Takamura¹
¹Japan Advanced Institute of Science and Technology (JAIST), JAPAN and ²NVU University of Science, VIETNAM

M.063c
IMPROVED SURFACE ACOUSTIC WAVE SENSOR FOR LOW CONCENTRATION AMMONIA/METHANE MIXTURE GASES DETECTION
National Tsing Hua University, TAIWAN

M.064c
MICROFLUIDIC DROPLET-BASED AMPEROMETRIC SENSOR FOR IMMOBILIZATION-FREE ENZYME INHIBITION ASSAY
S. Gu¹, Y. Lu¹, Y. Ding¹, L. Li¹, F. Zhang¹, and Q. Wu²
¹Shanghai University, CHINA and ²Tongji University, CHINA

M.065c
ULTRASENSITIVE HYDRODYNAMIC ELECTROCHEMISTRY USING SOUND WAVE DRIVEN MICROSTREAMING
E. Kaplan, J. Reboud, A. Glidle, and J.M. Cooper
University of Glasgow, UK

Visualization & Imaging Technologies

M.066c
IN SITU NON-INVASIVE ELECTROCHEMICAL MONITORING OF MICROTISSUE DIFFERENTIATION IN MICROWELL ARRAYS
A. Sridhar, A. van den Berg, and S. Le Gac
University of Twente, THE NETHERLANDS

M.067c
ON-CHIP FLUORESCENCE MICROSCOPY FOR WIDE FIELD-OF-VIEW HIGH-THROUGHPUT PHYNOTYPE SCREENING OF CAENORHABDITIS ELEGANS
C. Han, S. Pang, M. Kato, P. Sternberg, and C. Yang
California Institute of Technology, USA

M.068c
USE OF A PARYLENE-C BONDING LAYER FLUORESCENCE AS REFERENCE FOR ON-CHIP IMAGING AND DETECTION APPLICATIONS
D.G. Dupouy, A.T. Ciftlik, and M.A.M. Gijs
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

Optical Detection

M.069c
A SINGLE LIVING BACTERIUM’S REFRACTIVE INDEX MEASUREMENT BY USING OPTOFLUIDIC IMMERSION REFRACTOMETRY
Y. Liu¹, L.K. Chin¹, W. Ser¹, T.C. Ayi², W.M. Ho², P.H. Yap², Y. Leprince-Wang³, and T. Bourouina³
¹Nanyang Technological University, SINGAPORE, ²DSO National Laboratories, SINGAPORE, and ³University of Paris Est, FRANCE
DEVELOPMENT OF NOVEL MICRO OPTICAL DIFFUSION SENSOR USING COMB-DRIVEN MICRO FRESNEL MIRROR

Y. Matoba, Y. Taguchi, and Y. Nagasaka
Keio University, JAPAN

FLATBED SCANNER-BASED DETECTION FOR CAPILLARY-ASSEMBLED MICROCHIP

S. Kubo, T.G. Henares, S.-I. Funano, K. Sueyoshi, T. Endo, and H. Hisamoto
Osaka Prefecture University, JAPAN

MAGNETO-OPTICAL DETECTION OF MAGNETIC NANOBeads IN A MICROFLUIDIC CHANNEL

M. Donolato1,2, P. Vavassori3, and M.F. Hansen2
1CIC nanoGUNE, SPAIN, 2Danmarks Tekniske Universitet (DTU), DENMARK, and 3IKERBASQUE, SPAIN

OPTICAL SENSING AND ANALYSIS SYSTEM BASED ON POROUS LAYERS

A. Kovacs1, A. Malisauskaite1, A. Ivanov1, U. Mescheder1, and R. Wittig2
1Furtwangen University, GERMANY and 2University Ulm, GERMANY

Mass Spectrometric Detection

COUPLING MICROFLUIDIC DROPLET ARRAY WITH ELECTROSpray IONIZATION MASS SPECTROMETRY WITH A “PHOENIX” SAMPLING PROBE FOR HIGH-THROUGHPUT AND LABEL FREE SCREENING OF ENZYME INHIBITORS

D.-Q. Jin, Y. Zhu, and Q. Fang
Zhejiang University, CHINA

Novel Functionalities in Integrated Microfluidic Platforms

Platforms Based on Capillary Forces (Paper Based Microfluidics, Lateral Flow Tests)

A DISPOSABLE CHIP ENABLING METERING IN DRIED BLOOD SPOT SAMPLING

G. Lenk1, A. Pohanka2, G. Stemme1, O. Beck2, and N. Roxhed1
1Royal Institute of Technology (KTH), SWEDEN and 2Karolinska University Hospital, SWEDEN

FABCHIPS: A WEAVING-BASED FABRIC PLATFORM FOR AFFORDABLE MICROFLUIDIC CHIP MANUFACTURE

D. Dendukuri, P. Bhandari, T. Choudhary, S. Sridharan, S.V. Shalini
Achira Labs, INDIA

FAST PROTOTYPING OF PAPER-BASED MICROFLUIDIC BY CONTACT STAMPING

V.F. Curto1, N. Lopez-Ruiz2, L.F. Capitan-Vallvey2, A.J. Palma2, F. Benito-Lopez2, and D. Diamond1
1Dublin City University, IRELAND, 2University of Granada, SPAIN, and 3CIC microGUNE, SPAIN

REAL-TIME FLOW MEASUREMENT IN PAPER-BASED MICROFLUIDICS

J.-R. Han, K. Abi-Samra, C. Bathany, and Y.-K. Cho
Ulsan National Institute of Science and Technology (UNIST), SOUTH KOREA
Microfluidic Large Scale Integration

M.079d
PROXIMITY LIGATION ASSAY FOR HIGH CONTENT PROFILING OF CELL SIGNALING PATHWAYS ON A MICROFLUIDIC CHIP
M. Blazek, R. Zengerle, and M. Meier
University of Freiburg - IMTEK, GERMANY

Digital Microfluidics on Surfaces

M.080d
DIGITAL MICROFLUIDIC FEMTOLITER DROPLET PRINTING: A VERSATILE TOOL FOR SINGLE-MOLECULE DETECTION OF NUCLEIC ACIDS AND PROTEINS
D. Witters, F. Toffalini, R. Puers, and J. Lammertyn
University of Leuven, BELGIUM

Segmented Flow & Droplet Based Microfluidics in Channels

M.081d
A HIGH THROUGHPUT DROPLET-BASED MICROFLUIDIC BARCODE GENERATOR
Y. Ding, S. Stavrakis, X. Casadevall i Solvas, and A.J. deMello
ETH Zürich, SWITZERLAND

M.082d
A NOVEL MICROFLUIDIC DROPLET MANIPULATION METHOD FOR FABRICATION OF REVERSE-PHASE TWO LAYER LAYER-BY-LAYER PROTEIN MICROCAPSULES
C. Kantak1, S. Beyer1,2, and D. Trau1
1National University of Singapore, SINGAPORE and
2Singapore-MIT Alliance for Research and Technology (SMART), SINGAPORE

M.083d
AGITATION PROGRAMMABLE PICOLITER DROPLET ARRAYS FOR HTS OF RECOMBINANT ESCHERICHIA COLI
J.W. Lim, M. Jia, S.K. Lee, and T. Kim
Ulsan National Institute of Science and Technology (UNIST), SOUTH KOREA

M.084d
NOVEL MIXING METHOD FOR CROSS LINKER INTRODUCTION INTO DROPLET EMULSIONS
K.J. Land1,2, M.M. Mbanjwa2, and J.G. Korvink2
1Council for Scientific and Industrial Research (CSIR), SOUTH AFRICA and 2University of Freiburg - IMTEK, GERMANY

M.085d
TUNABLE STANDING SURFACE ACOUSTIC WAVE (SSAW)-BASED MULTICHANNEL DROPLET SORTER
S. Li, X. Ding, F. Guo, Y. Chen, C.E. Cameron, and T.J. Huang
Pennsylvania State University, USA

Centrifugal Microfluidics

M.086d
CENTRIFUGE-BASED SINGLE CELL ENCAPSULATION IN HYDROGEL MICROBEADS FROM ULTRA LOW VOLUME OF SAMPLES
K. Inamori1, H. Onoe1,2, M. Takinoue3, and S. Takeuchi1,2
1University of Tokyo, JAPAN, 2Japan Science and Technology Agency (JST), JAPAN, and 3Tokyo Institute of Technology, JAPAN

M.087d
IMBIBITION-MODULATED EVENT-TRIGGERING OF CENTRIFUGO-PNEUMATIC CASCADING FOR MULTI-STAGE DILUTION SERIES
D.J. Kinahan, S.M. Kearney, M.T. Glynn, and J. Ducrée
Dublin City University, IRELAND
MICROFLUIDIC APP FEATURING NESTED PCR FOR FORENSIC SCREENING ASSAY ON OFF-THE-SHELF THERMOCYCLER
M. Keller1, J. Naue2, P. Papireddy Vinayaka3, O. Strohmeier1, D. Mark1, U. Schmidt2, R. Zengerle3, and F. von Stetten1
1Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY, 2Universitätsklinikum Freiburg, GERMANY, and 3University of Freiburg - IMTEK, GERMANY

OLED-INDUCED FLUORESCENCE DETECTION SYSTEM FOR COMPACT DISK-TYPE MICROFLUIDIC DEVICE
K. Morioka1, A. Hemmi2, H. Zeng1, K. Uchiyama1, and H. Nakajima1
1Tokyo Metropolitan University, JAPAN and 2Mebius Advanced Technology Ltd., JAPAN

MICROFLUIDIC FREE-FLOW ELECTROPHORETIC SEPARATION OF PROTEINS USING ELECTRICALLY SWITCHABLE pH ACTUATORS AND 3D EMBEDDED SALT BRIDGES
L.J. Cheng
Oregon State University, USA

A SELF-CONTAINED, USER-FRIENDLY, PROGRAMMABLE CELL STIMULATION PLATFORM
A.K. Au1, S. Gibbs1, A. Scott1, L.F. Horowitz2, E. Vinckenbosch1,2, B. Otis1, and A. Folch1
1University of Washington, USA and 2École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

DEVELOPMENT OF MICROFLUIDIC DEVICE WITH MOVABLE ELECTRODE FOR ELECTRICAL IMPEDANCE MEASUREMENT ON THE ACTIVELY COMPRESSED SINGLE CELL
J.Y. Kim1,2 and Y.E. Yoo1,2
1Korea Institute of Machinery & Materials (KIMM), SOUTH KOREA and 2University of Science & Technology, SOUTH KOREA

ENCAPSULATING BEADS/CELLS IN UNIFORM-SIZED DROPLETS ON A MICROFLUIDIC CHIP UTILIZING HYDROPHILIC MODIFICATION OF A SURFACE
C.J. Huang, H.H. Chan, and J.T. Yang
National Taiwan University, TAIWAN

MINATURIZED OPTO-FLUIDIC SYSTEM FOR ON-THE-FLOW ANALYTE CHARACTERIZATION BASED ON SPATIAL MODULATION TECHNIQUE
P. Kiesel, J. Martini, M. Recht, M. Bern, and N. Johnson
PARC - a Xerox Company, USA

ONE-STEP SOLID PHASE-BASED ON-CHIP SAMPLE PREPARATION AND INTEGRATION WITH FLOW-THROUGH POLYMERASE CHAIN REACTION
K.T.L. Trinh, H.H. Tran, Y. Zhang, J. Wu, and N.Y. Lee
Gachon University, SOUTH KOREA

SUPERHYDROPHOBIC, PASSIVE MICROVALVES WITH CONTROLLABLE OPENING PRESSURE, AND APPLICATIONS IN FLOW CONTROL
K. Ellinas, A. Tserepi, and E. Gogolides
NCSR Demokritos, GREECE
**M.097d**

**VARIATION OF CELLS IN CONTROLLED OXYGEN TENSION BY MICRO-FLUIDIC DEVICE**

S. Ji¹, D. An¹, E. Lee², K. Lee¹, and J. Kim¹

¹Dankook University, SOUTH KOREA and ²Seoul National University, SOUTH KOREA

**Cells & Liposomes on Chip**

**Cell Capture, Counting, & Sorting**

**M.098e**

**HIGH EFFICIENCY SINGLE CELL CAPTURE CHIP UTILIZING HERRINGBONE VORTICES FOR SMALL SAMPLE ANALYSIS**

Y.-H. Cheng, Y.-C. Chen, P. Ingram, and E. Yoon

University of Michigan, USA

**M.099e**

**SLANTED LATTICE-SHAPED MICROCHANNEL NETWORKS FOR CONTINUOUS SORTING OF MICROPARTICLES AND CELLS**

W. Seko, M. Yamada, and M. Seki

Chiba University, JAPAN

**M.100e**

**MICROARRAY PLATFORM FOR THE ISOLATION OF VIABLE NON-ADHERENT CELLS**

P.J. Attayek¹,², Y. Wang¹, B.G. Vincent¹, P.M. Armistead¹, C.E. Sims¹, and N.L. Allbritton¹,²

¹University of North Carolina, USA and ²North Carolina State University, USA

**M.101e**

**SHALLOW ANTIBODY-COATED MICROCHANNEL BASED SELECTIVE CELL CAPTURE AND ANALYSIS**

Y. Tanaka¹, K. Jang², J. Wakabayashi³, R. Ishii¹, K. Sato³, K. Mawatari³, M. Nilsson⁴, and T. Kitamori²

¹Institute of Physical and Chemical Research (RIKEN), JAPAN, ²University of Tokyo, JAPAN, ³Japan Women's University, JAPAN, and ⁴Uppsala University, SWEDEN

**Circulating Tumor Cells**

**M.102e**

**ENRICHMENT OF PROSTATE CANCER CELLS FROM BLOOD CELLS WITH A HYBRID DIELECTROPHORESIS AND IMMUNOCAPTURE MICROFLUIDIC SYSTEM**

C. Huang¹, J.P. Smith¹, H. Liu², N.H. Bander², and B.J. Kirby¹

¹Cornell University, USA and ²Weill Medical College of Cornell University, USA

**M.103e**

**MICROFLUIDIC DETECTION OF CIRCULATING TUMOR CELLS (CTC) USING SIDE FILTRATION-BASED CAPTURE**

S.W. Lee¹,², J.Y. Kang¹, H.I. Jung², and K.A. Hyun²

¹Korea Institute of Science and Technology (KIST), SOUTH KOREA and ²Yonsei University, SOUTH KOREA

**M.104e**

**DEVELOPMENT OF SPECIFIC APTAMERS WITH DIFFERENT HISTO-LOGICAL CLASSIFIED OVARIAN CANCER CELLS BY UTILIZING ON-CHIP OVCA CELL-SELEX**

L.-Y. Hung¹, C.-H. Wang¹, K.-F. Hsu², C.-Y. Chou², and G.-B. Lee¹

¹National Tsing Hua University, TAIWAN and ²National Cheng Kung University, TAIWAN

**Single Cell Analysis**

**M.105e**

**A NEW INDEX OF CELL FATIGUE UNDER RECIPROCATIVE STRESS TEST**

K. Kuroda¹, W. Fukui¹, M. Kaneko¹, S. Sakuma¹, and F. Arai²

¹Osaka University, JAPAN and ²Nagoya University, JAPAN
M.106e
CELL STRETCHING MICRODEVICE FOR EVALUATING CELLULAR BIOMECHANICS BASED ON IN-SITU CELLULAR RESPONSE OBSERVATION
Y. Nakashima, R. Monji, K. Sato, and K. Minami
1Kumamoto University, JAPAN, 2Yamaguchi University, JAPAN, and 3University of Tokushima, JAPAN

M.107e
ELECTROACTIVE MICROWELL ARRAY TOWARDS SINGLE CIRCULATING TUMOR CELL ANALYSIS
M. Kobayashi, S.H. Kim, S. Kaneda, and T. Fujii
University of Tokyo and Japan Science and Technology Agency (JST), JAPAN

M.108e
MEASUREMENT OF DRUG ACCUMULATION IN SINGLE ACUTE MYELOID LEUKEMIA (AML) PATIENT CELLS USING A MICROFLUIDIC DIELECTROPHORESIS (DEP) CHIP
A. Khamenehfar, Y. Chen, D.E. Hogge, and P.C.H. Li
1Simon Fraser University, CANADA and 2BC Cancer Agency, CANADA

M.109e
MULTIPARAMETER HIGH-THROUGHPUT MECHANICAL PHENOTYPING
M. Masaeli, H.T.K. Tse, D.R. Gossett, D. Gupta, and D. Di Carlo
1University of California, Los Angeles, USA, 2California NanoSystems Institute, USA and 3CytoVale, Inc., USA

M.110e
OPTICALLY-CONTROLLED SELECTIVE TRANSFECTION OF PARTICLE USING MULTILAYERED LIPOSOME CONTAINING PHOTOCHROMIC CHEMICAL INTO A CELL NUCLEUS
H. Maruyama, T. Masuda, and F. Arai
Nagoya University, JAPAN

M.111e
SINGLE CELL OSCILLATORY PLATFORM FOR EXTRACELLULAR STIMULATION (SCOPES) OVER A LARGE TEMPORAL DYNAMIC RANGE
L. Chingozha, M. Zhan, C. Zhu, and H. Lu
Georgia Institute of Technology, USA

M.112e
SPATIAL RESOLUTION OF EXOCYTOSIS ACROSS A SINGLE CELL BY A MICROWELL-BASED INDIVIDUALLY ADDRESSABLE THIN FILM ULTRA-MICROELECTRODE ARRAY
J. Wang, R. Trouillon, J. Dunevall, and A.G. Ewing
1University of Gothenburg, SWEDEN and 2Chalmers University of Technology, SWEDEN

Liposomes/Vesicles

M.113e
CONTROLLED FUSION OF GIANT UNILAMELLAR VESICLES USING VIRAL FUSOGENIC PEPTIDES
E. Boenzli, M. Hadorn, and P.S. Dittrich
Swiss Federal Institute of Technology, SWITZERLAND

M.114e
QCM DETECTION OF GPCR-LIGAND BINDING USING CELL-DERIVED LIPOSOMES
M. Yamanaka, S. Sueda, and T. Yasuda
Kyushu Institute of Technology, JAPAN

Stem Cells

M.115e
LARGE-AREA OPEN-WELL OXYGEN LANDSCAPES VIA MICROFLUIDIC NETWORKS FOR BIOLOGICAL ANALYSIS
University of Illinois, Chicago, USA
Cell-Surface Interaction

M.116e
AN ELECTRICAL POTENTIAL DRIVEN SURFACE MOLECULAR GRADIENT TECHNIQUE FOR CELL BEHAVIOR STUDIES
S.-L. Chung, Y.-Y. Huang, C.-T. Lin, and P.-L. Kuo
National Taiwan University, TAIWAN

M.117e
MECHANICAL CELL CONTACT SYSTEM BY A PARYLENE RAIL FILTER FOR STUDY OF CELL-CELL INTERACTION MEDIATED BY CONNEXIN GAP JUNCTION
Y. Abe1,3, K. Kamiya1, T. Osaki1,2, R. Kawano1, K. Akiyoshi4, N. Miki1,3, and S. Takeuchi1,2
1Kanagawa Academy of Science and Technology, JAPAN, 2University of Tokyo, JAPAN, 3Keio University, JAPAN, and 4Kyoto University, JAPAN

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

M.118e
3D FIBER-SHAPED CULTURE SYSTEM PROMOTES DIFFERENTIATION OF MULTIPOTENT DFAT CELLS INTO SMOOTH MUSCLE-LIKE CELLS
A.Y. Hsiao1, T. Okitsu1,2, H. Ono1,2, M. Kiyosawa2, H. Teramae3, S. Iwanaga2, S. Miura2, T. Kazama4, T. Matsumoto5, and S. Takeuchi1,2
1University of Tokyo, JAPAN, 2Japan Science and Technology Agency (JST), JAPAN, 3Shumei University, JAPAN, and 4Nihon University School of Medicine, JAPAN

M.119e
AMPLIFIED MICROELECTRODE RECORDINGS OF NEURON CLUSTERS IN A THREE DIMENSIONAL CELL CULTURE CHIP
M. Son1, I. Choi1, S. Chung2, and J. Kang1
1Korea Institute of Science and Technology (KIST), SOUTH KOREA and 2Korea University, SOUTH KOREA

M.120e
GEOMETRIC CONTROL AND CHEMICAL RESPONSE OF CELLULAR CLUSTERS USING FREE-STANDING MESSED HYDROGEL
C.Y. Bae, M.-K. Min, H. Kim, and J.-K. Park
Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA

M.121e
MICROFLUIDIC CULTURE OF PRIMARY NEURONS WITH ON-CHIP HYPOXIC CONDITIONING
A. Takano1, S. Inomata1, M. Tanaka1, and N. Futai2
1Tokyo Denki University, JAPAN and 2Shibaura Institute of Technology, JAPAN

M.122e
ON-CHIP TRAPPING AND VIABILITY ASSESSMENT OF SUBMICROLITER PRIMARY TISSUES FOR PERSONALIZED TREATMENT OF OVARIAN CANCER
1Polytechnique Montréal, CANADA, 2Université de Montréal, CANADA, 3Centre hospitalier de l’Université de Montréal, CANADA, 4Institut du cancer de Montréal, CANADA, and 5Indian Institute of Technology Delhi, INDIA

M.123e
STRETCHABLE PROTEIN-BASED GELS FOR 2.5 D AND 3 D MECHANOTRANSDUCTION STUDIES
C.S. Simmons1,2, M.A. Burkhardt3, V. Vogel3, and B.L. Pruitt1
1Stanford University, USA, 2University of Florida, USA, and 3ETH Zürich, SWITZERLAND

Inter- & Intracellular Signaling, Cell Migration

M.124e
ARCHITECTURE-DEPENDENT COLLECTIVE CALCIUM SIGNALING IN MICROENGINEERED AND SELF-ORGANIZED ENDOTHELIAL CELL NETWORKS
J. Sun and P.K. Wong
University of Arizona, USA
M.125e
MICRO MAGNET CHIPS TO STUDY NANOPARTICLE FORCE-INDUCED NEURAL CELL MIGRATION
A. Kunze, P. Tseng, C. Murray, A. Caputo, F.E. Schweizer, and D. Di Carlo
University of California, Los Angeles, USA

M.126e
THE ANGIOGENIC SPROUTING OF ENDOTHELIAL CELLS IN THREE-DIMENSIONAL COLLAGEN GEL MATRIX
H.E. Jeong¹, H.-R. Seo², H.J. Joo³, and S. Chung¹
¹Korea University, SOUTH KOREA and ²Korea University Medical College, SOUTH KOREA

Others

M.127e
ENGINEERING MOUNTAIN FOLDS IN CELL ORIGAMI
D. Serien and S. Takeuchi
University of Tokyo, JAPAN

M.128e
ROOM TEMPERATURE UNIFORM AND HIGH THROUGHPUT AGAROSE GEL MICRO DROPLET GENERATION FOR SINGLE CELL ANALYSIS
Waseda University, JAPAN

Organs & Organisms

Organs on Chip

M.129f
BODY-ON-A-CHIP: ON-CHIP HEART RECEIVING METABOLITES FROM ON-CHIP LIVER
A. Williamson, U. Fernekorn, S. Singh, and A. Schober
Technische Universität Ilmenau, GERMANY

M.130f
LIVE HUMAN UPPER AIRWAY ON CHIP FOR IN VITRO TESTING OF GASEOUS FORMALDEHYDE TOXICITY VIA AIRWAY DELIVERY
W. Wang¹, Y. Yan², C.W. Li³, D.Y. Wang⁴, H.M. Xia¹, and Z.P. Wang¹
¹Singapore Institute of Manufacturing Technology, SINGAPORE and ²National University of Singapore, SINGAPORE

M.131f
THREE DIMENSIONAL (3-D) CELL-LOCATION ALIGNMENT USING CELL SHEET ENGINEERING FOR TISSUE CONSTRUCTION
H. Ota, N. Tanaka, K. Fukumori, S. Sekiya, J. Kobayashi, Y. Akiyama, M. Yamato, and T. Okano
Tokyo Women's Medical University, JAPAN

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

M.132f
GLASS-CAPILLARY-ACCESSIBLE DYNAMIC MICROARRAY FOR MICROINJECTION OF ZEBRAFISH EMBRYOS
S. Miura¹2, T. Teshima¹, F. Tomoike¹, and S. Takeuchi¹2
¹University of Tokyo, JAPAN and ²Japan Science and Technology Agency (JST), JAPAN

Alternatives to Animal Testing

M.133f
DEVELOPMENT OF A MICROFLUIDIC CARDIOVASCULAR SYSTEM FOR EVALUATION OF RENAL CLEARANCE AND CELL CULTURE
Y. Sakuta, K. Tsunoda, and K. Sato
Gunma University, JAPAN
Diagnostics & Analytics

Sample Preparation (Whole blood, Saliva, Cells, Tissue, Food, etc.)

M.134g  
A WORLD-TO-DIGITAL MICROFLUIDIC INTERFACE FOR TOTAL RNA EXTRACTION FROM BLOOD SAMPLES  
_Sandia National Laboratory, USA_

M.135g  
CHARACTERIZATION OF MICROFLUIDIC COMPONENTS FOR LOW-COST POINT-OF-CARE DEVICES  
S. Hugo¹, K. Land¹, and H. Becker²  
¹_Council for Scientific and Industrial Research (CSIR), SOUTH AFRICA_, and ²_microrheic ChipShop, GERMANY_

M.136g  
OPTIMIZATION AND CHARACTERIZATION OF DIELECTROPHORETIC SAMPLE PREPARATION SYSTEM FOR MULTIPLEX PCR SLIPCHIP  
D. Cai and W. Du  
_Renmin University of China, CHINA_

Nucleic Acid Analysis (e.g. Digital PCR, Next Generation Sequencing)

M.137g  
DEVELOPMENT OF A DEVICE PLATFORM FOR PREDICTIVE AND PROGNOSTIC POINT-OF-CARE TESTING USING THE EXAMPLE OF PATHOGEN IDENTIFICATION  
R. Götzen¹, F. Scherag², G. Suiz³, M. Schmidt⁴, M. Panning⁴, H. Attig⁴, T. Brandstetter⁵, and J. Rühe²  
¹_University of Freiburg, GERMANY_, ²_microrheic Gesellschaft für Mikrotechnologie mbH, GERMANY_, ³_Fraunhofer Institute for Physical Measurement Technique IPM, GERMANY_, ⁴_Micropelt GmbH, GERMANY_, and ⁵_Qiagen GmbH, GERMANY_

M.138g  
DIRECT DETECTION OF PLASMID-MEDIATED ANTIBIOTIC RESISTANCE IN BLOODSTREAM INFECTION BY PCR USING WIRE-GUIDED DROPLET MANIPULATION (WDM)  
D.K. Harshman, R. Reyes, and J.-Y. Yoon  
_University of Arizona, USA_

M.139g  
IDENTIFYING BACTERIA USING DNA BINDING MAPS  
G. Emilsson¹, A. Nilsson¹, L.K. Nyberg¹, C. Noble², L. Svensson Stadler³, E.R.B. Moore³, T. Ambjörnsson², J. Tegenfeldt³, and F. Westerlund³  
¹_Chalmers University of Technology, SWEDEN_, ²_Lund University, SWEDEN_, and ³_University of Gothenburg, SWEDEN_

M.140g  
MICROCHIP-BASED RAPID IDENTIFICATION OF BACILLUS ANTHRACIS IN PORTABLE GEL ELECTROPHORESIS DEVICE  
W. Kubicki and R. Walczak  
_Wroclaw University of Technology, POLAND_

M.141g  
SINGLE DNA MOLECULE EXTRACTION FROM SINGLE BACTERIUM USING NANOWIRE STRUCTURES  
K. Ootsuka¹, T. Yasui¹, N. Kaji¹, S. Rahong², T. Yanagida³, M. Kainari², K. Nagashima², T. Kawai², and Y. Baba¹³  
¹_Nagoya University, JAPAN_, ²_Osaka University, JAPAN_, and ³_National Institute of Advanced Industrial Science and Technology (AIST), JAPAN_

M.142g  
VIRUS PURIFICATION, RNA EXTRACTION, AND TARGETED GENOME CAPTURE IN ONE CHIP  
M. Niimi¹, T. Masuda¹, K. Kishiatsu², N. Kato², and F. Arai¹  
¹_Nagoya University, JAPAN_ and ²_Osaka University, JAPAN_
Protein Analysis & Characterization (e.g. Proteomics)

M.143g
LOW-COST, HIGH LIQUID VOLUME SILICON QUILL PINS FOR ROBUST AND REPRODUCIBLE PRINTING OF ANTIBODY MICROARRAYS
V. Laforte, A. Olanrewaju, and D. Juncker
McGill University, CANADA

M.144g
MULTIPLE PROTEINS DETECTION DIRECTLY FROM CLINICAL URINE SAMPLE USING AN INTEGRATED CHIP
R.G. Wu, Z.P. Wang, and D.Y.P. Seah
Singapore Institute of Manufacturing Technology, SINGAPORE

Clinical Chemistry

M.145g
A DIGITAL MICROFLUIDIC PLATFORM FOR AUTOMATED IMMUNOASSAYS OPTIMIZED USING “DESIGN OF EXPERIMENTS” (DOE) METHODS
K. Choi¹, A.H.C. Ng¹, R. Fobel¹, D.A. Chang-Yen², L.E. Yarnell³, E.L. Pearson², C.M. Oleksak², A.T. Fischer², R.P. Luoma³, J.M. Robinson², and A.R. Wheeler¹
¹University of Toronto, CANADA and ²Abbott Diagnostics, USA

M.146g
AUTOMATIC PH CHANGING SYSTEM FOR SENSITIVITY IMPROVEMENT OF ELISA ON LAB-ON-PAPER
A. Apilux¹²³, Y. Ukita¹, M. Chikae¹, O. Chailapakul³, and Y. Takamura¹
¹Japan Advanced Institute of Science and Technology, JAPAN, ²Mahidol University, THAILAND, and ³Chulalongkorn University, THAILAND

M.147g
SINGLE-STEP ENZYNE IMMUNOASSAY USING LIPOPHILIC FLUORESCENT SUBSTRATE FOR CAPILLARY-ASSEMBLED MICROCHIP
M. Sugahara, S.-I. Funano, T.G. Henares, K. Sueyoshi, T. Endo, and H. Hisamoto
Osaka Prefecture University, JAPAN

Drug Development

M.148g
QUANTITATIVE ANALYSIS OF MULTIPLE ANTIBODY-LIGAND INTERACTIONS IN A MICROCHIP USING FLUORESCENCE POLARIZATION ANISOTROPY
K. Eyer, T. Robinson, P. Kuhn, and P.S. Dittrich
ETH Zürich, SWITZERLAND

Others

M.149g
MOVING THE SOLID PHASE: A STATIONARY MICROFLUIDICS PLATFORM TECHNOLOGY FOR CARTRIDGE BASED SANDWICH IMMUNOASSAYS
R. Gottheil¹, N. Baur¹, H. Becker², A. Geiger³, V. Hummel³, A. Normann³, A. Haage³, G. Link¹, D. Maier¹, N. Schneiderhan-Marra¹, and M. Stelzle¹
¹NMI Natural and Medical Sciences Institute, GERMANY, ²Microfluidic ChipShop GmbH, GERMANY, and ³Mediagnost GmbH, GERMANY
Medical Research & Applications

Cancer Research

M.150h
A 96-WELL, PLATE-BASED MICROFLUIDIC DEVICE FOR MULTIPLEXED CHEMOSENSITIVITY TESTING OF INTACT TISSUES
T. Chang, A.M. Mikheev, R.J. Monnat, Jr., R.C. Rostomily, and A. Folch
University of Washington, USA

M.151h
FLUORESCENCE IN SITU HYBRIDIZATION (FISH) MICROFLUIDIC PLATFORM FOR DETECTION OF HER-2 OVER-EXPRESSION IN CANCER CELLS
K.-J. Kao¹, C.-H. Ta², W.-Y. Luo¹, T.-S. Yeh¹, and G.-B. Lee¹
¹National Tsing Hua University, TAIWAN, ²National Cheng Kung University, TAIWAN, and
³Chang Gung University College of Medicine, TAIWAN

M.152h
PATTERNED MULTICELLULAR SPHEROIDS IN 3D MATRIX FOR TUMOR INVASION AND VASCULOGENIC MIMICRY IN GLIOMA CELLS
X. Zhang, J. Ma, and J. Qin
Chinese Academy of Sciences, CHINA

M.153h
THREE-DIMENSIONAL MICROVESSEL ARRAY FOR TUMOR ANGIOGENESIS ASSAY
W. Park, H. Lee, H. Ryu, S. Kim, and N.L. Jeon
Seoul National University, SOUTH KOREA

Personalized Medicine

M.154h
OPTICAL DETECTION OF KRAS POINT MUTATIONS VIA HYBRIDIZATION-INDUCED AGGREGATION (HIA) OF MAGNETIC MICROBEADS FOR THE DEVELOPMENT OF A POINT-OF-CARE GENOTYPING
H.S. Sloane, B.C. Strachan, J.C. Lee, D.C. Miranian, K.A. Kelly, and J.P. Landers
University of Virginia, USA

Drug Delivery Systems

M.155h
HIGH PRODUCTION RATES OF STABLE DRUG-LOADABLE MICROBUBBLES TOWARD TARGETTED, TRIGGERED DRUG DELIVERY
S.A. Peyman¹, R. Abou-Saleh¹, N. Ingram², G. Marston², P.L. Coletta², and S.D. Evans¹
¹University of Leeds, UK and ²St. James's Hospital, UK

M.156h
MICROFLUIDIC-DIRECTED SYNTHESIS OF NANOSCALE LIPOSOMES FOR TRANSDERMAL DRUG DELIVERY
R.R. Hood¹, E.L. Kendall¹, W.N. Vreeland², Z. Quezado³, M. Junqueira³, J.C. Finkel³, and D.L. DeVoe¹
¹University of Maryland, College Park, USA, ²National Institute of Standards and Technology, USA, and
³Children's National Medical Center, USA

M.157h
TOWARDS AN IMPLANTABLE PULSED MODE ELECTROLYTIC DRUG DELIVERY SYSTEM
Y. Yi, U. Butner, and I.G. Foulds
King Abdullah University of Science and Technology (KAUST), SAUDI ARABIA
Regenerative Medicine & Tissue Engineering

M.158h
FORMATION OF VASCULAR STRUCTURES INSIDE CELL SPHEROIDS BY EMPLOYING HYDROGEL MICROCHAMBERS AND SACRIFICIAL FIBERS
K. Yamakoshi, M. Yamada, and M. Seki
Chiba University, JAPAN

M.159h
ORGANIC-INORGANIC HYBRID HYDROGEL MICROBEADS FOR RAPID BONE FORMATION
S. Iwanaga1,2, Y. Morimoto1, and S. Takeuchi1,2
1University of Tokyo, JAPAN and 2Japan Science and Technology Agency (JST), JAPAN

Assisted Reproductive Technologies

M.160h
MICROFLUIDIC PROTOCOL FOR IN VITRO CULTURE OF HUMAN EMBRYOS
Z. Hao1, D.C. Kieslinger2, C. Vergouw2, H. Kostelijk2, C.B. Lambalk2, and S. Le Gac1
1MESA+, University of Twente, THE NETHERLANDS and 2VU University Medical Center, THE NETHERLANDS

Implantable and Surgical Microdevices

M.161h
DEVELOPMENT OF A STRETCHABLE, PENETRATING ELECTRODE ARRAY FOR MEASURING INTRAMUSCULAR ELECTROMYOGRAPHIC ACTIVITY
G.S. Guvanasen1, R.J. Aguilar2, L. Guo3, C. Karnati2, S. Rajaraman2, T.R. Nichols1, and S.P. DeWeerth1,4
1Georgia Institute of Technology, USA, 2Axion Biosystems, Inc., USA, 3Massachusetts Institute of Technology, USA, and 4Emory University, USA

Devices for Better Quality-of-Life (QOL)

M.162h
DEVELOPMENT OF A BLOOD TESTING DEVICE BASED ON LOCALIZED SURFACE PLASMON RESONANCE
H. Kanamori, F. Takada, Y. Sasaki, M. Yamanaka, and T. Yasuda
Kyushu Institute of Technology, JAPAN

Neurobiology/Neuroscience

M.163h
3D IN VITRO MODEL OF NEURAL STEM CELL-VASCULAR NICHE
Y. Shin1, S. Han1, K. Yang2, S.-W. Cho2, and S. Chung1
1Korea University, SOUTH KOREA and 2Yonsei University, SOUTH KOREA

Others

M.164h
RAPID AND HIGH THROUGHPUT ANTIMICROBIAL SUSCEPTIBILITY TEST USING MORPHOLOGICAL ANALYSIS OF SINGLE CELLS WITH MICROFLUIDIC CHANNEL IN 96 WELL PLATFORM
J. Choi1,3, Y.-G. Jung2, E.K. Kim1,2,3, M. Lee2, J. Yoo2, and S. Kwon1
1Seoul National University, SOUTH KOREA, 2QuantaMatrix Inc., SOUTH KOREA, and 3Inter-university Semiconductor Research Center (ISRC), SOUTH KOREA
Separation Technologies

Electrophoretic Separations

M.165i
DEVELOPMENT OF ELECTROSPRAY IONIZATION INTERFACE-INTEGRATED MICROCHIP FOR MASS SPECTROMETRIC DETECTION IN ELECTROPHORESIS
M. Oketani1, T. Kawai2, T. Naito1, K. Sueyoshi3, T. Kubo1, F. Kitagawa4, and K. Otsuka1
1Kyoto University, JAPAN, 2University of Illinois, USA, 3Osaka Prefecture University, JAPAN, and 4Hirosaki University, JAPAN

M.166i
DUAL-COLOR MICROFLUIDIC IMMUNOASSAYS FOR MONITORING RELEASE OF MULTIPLE PEPTIDES FROM ISLETS OF LANGERHANS
L. Yi, A.R. Lomasney, and M.G. Roper
Florida State University, USA

M.167i
FAST DNA SIEVING THROUGH SELF-ENCLOSED SUBMICRON GLASS CAPILLARY SEGMENTS
Z. Cao and L. Yobas
Hong Kong University of Science and Technology, HONG KONG

M.168i
ICE GRAIN BOUNDARY ELECTROPHORESIS
A. Inagawa and T. Okada
Tokyo Institute of Technology, JAPAN

M.169i
MECHANISM OF DNA TRAPPING IN NANOPOROUS STRUCTURE
Y. Zhou1 and D.J. Harrison1,2
1University of Alberta, CANADA and 2National Institute for Nanotechnology, CANADA

Chromatographic Separations

M.170i
A NOVEL STATIONARY PHASE FOR LIGHT ALKANES SEPARATION IN MICROFABRICATED SILICON GAS CHROMATOGRAPHY COLUMNS
D. Lefebvre1, F. Ricoul1, B. Charleux2, and C. Thieuleux2
1Commissariat à l'énergie atomique (CEA), FRANCE and 2Universite de Lyon, FRANCE

M.171i
ONE-MINUTE SEPARATION OF BIOLOGICAL COMPOUNDS USING PILLAR ARRAY COLUMN WITH LOW DISPERSION AND LOW PRESSURE-DROP TURNS
M. Isokawa1, K. Takatsuki2, K. Shih3, M. Kono2, Y. Song1, T. Sekiguchi2, J. Mizuno2, T. Funatsu1, S. Shoji2, and M. Tsunoda1
1University of Tokyo, JAPAN and 2Waseda University, JAPAN

Particle Separations

M.172i
FABRICATION OF MULTI-LEVEL MICROCHANNELS BY USING GREY-SCALE PHOTOLITHOGRAPHY FOR SEPARATION AND EXTRACTION OF MICROPARTICLES
Y. Nam, M. Kim, and T. Kim
Ulsan National Institute of Science and Technology (UNIST), SOUTH KOREA

M.173i
INERTIAL MICROFLUIDIC BAND-PASS SEPARATIONS
X. Wang, J. Zhou and I. Papautsky
University of Cincinnati, USA
Others

M.174i
CHIP-BASED DNA SEPARATION IN FREE SOLUTION BY INERTIAL HYDRODYNAMIC FORCES
J.-K. Wu, S. Friedrich, K.J. Liu, and T.-H. Wang
*Johns-Hopkins University, USA*

**Microreaction Technology & Synthesis**

**Microreactors & Micromixers**

M.175j
ICE-CONFINED LIQUID PHASE MICROREACTOR ACCELERATING REACTIONS THEREIN
K. Anzo and T. Okada
*Tokyo Institute of Technology, JAPAN*

M.176j
MICROREACTOR FOR CONTINUOUS CELL-FREE PROTEIN SYNTHESIS USING CROSS-FLOW FILTRATION
H. Koch, M.S. Jaeger, and C. Duschl
*Fraunhofer Institute for Biomedical Engineering (IBMT), GERMANY*

**Filtering & Separation**

M.177j
BLOOD PLASMA SEPARATOR USING MICRO PILLERS ARRANGED LIKE A LABYRINTH
H. Tsutsui, H. Miyagawa, and M. Yano
*Osaka Institute of Technology, JAPAN*

**Chemical Synthesis**

M.178j
A VERSATILE TECHNIQUE FOR HETEROGENOUS CATALYTIC MICROCHEMISTRY: TOXIC/EXPENSIVE METAL COMPLEX IMMOBILIZATION ON MICROREACTOR CHANNEL
K.C. Basavaraju, and D.-P. Kim
*Pohang University of Science and Technology (POSTECH), SOUTH KOREA*

M.179j
GAS-LIQUID MICROFLUIDIC REACTORS FOR THE OXIDATIVE HOMOCOUPLING OF PHENYLACETYLENE
I. Lignos, K.S. Elvira, R.C.R. Wootton, and A.J. deMello
*ETH Zürich, SWITZERLAND*

M.180j
NON-INTRUSIVE MEASUREMENT OF CHEMICAL SPECIFICITY WITH MICRO RESOLUTION USING CARS MICROSCOPY
T. Noguchi, R. Kuriyama, K. Ozawa, and Y. Sato
*Keio University, JAPAN*

**Particle Synthesis**

M.181j
PLASMONIC DESIGN BY MICROFLUIDICS: SIZE-TUNED GOLD CUBES AND SILVER PRISMS OBTAINED BY SEGMENTED FLOW SYNTHESIS
A. Knauer, R. Roell, and J.M. Koehler
*Technische Universität Ilmenau, GERMANY*
Applications to Green & Environmental Technologies

Fuel Cells

M.182k
HIGH EFFICIENT DIRECT METHANOL FUEL CELL BY INSTANT MICRO-FUEL-DROPLETS SUPPLY
C.L. Lu1, T.-W. Liu1, W. Ling2, Y.-C. Su1, S.-H. Liang2, C.-H. Tai2, and F.-G. Tseng1,3
1National Tsing Hua University, TAIWAN, 2Industrial Technology Research Institute, TAIWAN, and 3Academia Sinica, TAIWAN

Water/ Air/ Soil Management

M.183k
THERMALLY-TARGETED ADSORPTION AND ENRICHMENT IN MICROSCALE HYDROTHERMAL PORE ENVIRONMENTS
A. Priye, Y.A. Hassan, and V.M. Ugaz
Texas A&M University, USA

Other Energy/Power Devices

M.184k
SOLAR LIGHT DRIVEN MICRO FUEL (H2/O2) GENERATION DEVICE BASED ON THE MICROFLUIDIC CHIP
Y. Pihosh1,2, Y. Kajita1, K. Mawatari1,2, and T. Kitamori1,2
1University of Tokyo, JAPAN and 2Japan Science and Technology Agency (JST), JAPAN

MicroTAS for Other Applications

Synthetic Biology

M.185l
PROTEIN EXPRESSION INSIDE OIL-FREE GIANT VESICLES BY USING PULSED JET FLOW METHOD
K. Kamiya1, R. Kawano1, T. Osaki1, and S. Takeuchi2
1Kanagawa Academy of Science and Technology (KAST), JAPAN and 2University of Tokyo, JAPAN

Bioinspired, Biomimetic & Biohybrid Devices

M.186l
ANTAGONISTIC LIVING MUSCLE ACTUATOR
Y. Morimoto1, H. Onoe1,2, and S. Takeuchi1,2
1University of Tokyo, JAPAN and 2Japan Science and Technology Agency (JST), JAPAN

M.187l
IN-AIR OPERABLE BIOHYBRID MICROMANIPULATOR POWERED BY INSECT HEART MUSCLE TISSUE
Y. Akiyama, K. Funakoshi, and K. Morishima
Osaka University, JAPAN

Bioprocess Technology

M.188l
DEVELOPMENT OF A MICROFLUIDIC PLATFORM FOR THE ON-LINE STUDY OF FLOCCULATION GROWTH KINETICS
A.N. Pallipurath Radhakrishnan, B. O'Sullivan, D.G. Bracewell, and N. Szita
University College London, UK

M.189l
POTENTIAL OF SINUSOIDAL GRADIENTS FOR DOSE RESPONSE ASSAYS IN DROPLET-BASED MICROFLUIDICS
M. Kielpinski1, T. Vasold1, P. Horbert1, K. Martin2, G. Mayer1, and T. Henkel1
1Institute of Photonic Technology (IPHT), GERMANY and 2Hans-Knöll-Institute (HKI), GERMANY
M.190l
AUTOMATIC FOOD-PATHOGEN DETECTION ON A CENTRIFUGAL MICROFLUIDIC CARTRIDGE IN A COMMERCIALLY AVAILABLE PCR THERMOCYCLER
M.C. Weil¹, W. Hauser², D. Kosse¹, O. Strohmeier¹,³, F. von Stetten¹,³, R. Zengerle¹,³, and D. Mark¹
¹Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY,
²Institut für Produktqualität, GERMANY, and ³University of Freiburg - IMTEK, GERMANY

16:00 - 16:30 Break and Exhibit Inspection

16:30 - 17:15 Plenary Presentation III
THE BIOSS NANOSCALE EXPLORER PROGRAM (BiNEP)
Michael Reth
University of Freiburg, GERMANY

Session 1A3 - Fiber and Particle Manufacturing

17:30 - 17:50
RAPID FORMATION OF ANISOTROPIC NON-SPHERICAL HYDROGEL MICROPARTICLES WITH COMPLEX STRUCTURES USING A TABLETOP CENTRIFUGE-BASED MICROFLUIDIC DEVICE
M. Hayakawa¹, H. Onoe², K.H. Nagai², and M. Takinoue¹,³
¹Tokyo Institute of Technology, JAPAN, ²University of Tokyo, JAPAN, and
³Japan Science and Technology Agency (JST), JAPAN

17:50 - 18:10
MICROFLUIDIC SYNTHESIS OF HYBRID MICROFIBER ENCAPSULATED WITH ENCODED MICROSPHERES
Y. Yu, H. Wen, and J. Qin
Chinese Academy of Sciences, CHINA

18:10 - 18:30
MOLDED BIOCOMPATIBLE AND DISPOSABLE PDMS/SU-8 INKJET DISPENSER
A. Bsoul, S. Beyer, A. Ahmadi, B. Stoeber, E. Cretu, and K. Walus
University of British Columbia, CANADA

Session 1B3 - Cell Separation and Capture

17:30 - 17:50
EVOLUTION OF SECONDARY DEAN VORTICES IN SPIRAL MICROCHANNELS FOR CELL SEPARATIONS
N. Nivedita¹, P. Ligrani², and I. Papautsky¹
¹University of Cincinnati, USA and ²Saint Louis University, USA

17:50 - 18:10
MULTIPLEX GPCR INTERNALIZATION ASSAY USING REVERSE TRANSDUCTION ON ADENOVIRAL VECTOR IMMOBILIZED MICROPARTICLES
S. Han¹, H.J. Bae¹, W. Park², and S. Kwon¹
¹Seoul National University, SOUTH KOREA and ²Kyung Hee University, SOUTH KOREA

18:10 - 18:30
HIGH-THROUGHPUT SPERM SORTING BY SPERM FLOWING UPSTREAM IN A DUAL GRADIENT FLOW FIELD
Y.-N. Lin¹, P.-C. Cheng¹, R.-G. Wu¹, L.-C. Pan², and F.-G. Tseng¹
¹National Tsing Hua University, TAIWAN and ²Taipei Medical University, TAIWAN
Session 1C3 - Flow Control

17:30 - 17:50

**FLOCK-BASED MICROFLUIDIC DEVICES WITH FLOW CONTROL, REAGENT INTEGRATION AND MULTIPLEXING FOR SIMPLE ASSAYS**

M. Hitzbleck and E. Delamarche

*IBM Research-Zurich, SWITZERLAND*

17:50 - 18:10

**MICROFLUIDIC SOLUTION ISOLATED PUMPING (μSIP)**

J. Liu\(^1,2\), D. Mitra\(^1\), J.R. Waldeisen\(^1\), R.H. Henrikson\(^1\), Y. Park\(^1\), S. Li\(^2\), and L.P. Lee\(^1\)

\(^1\)University of California, Berkeley and \(^2\)Harbin Institute of Technology

18:10 - 18:30

**LASER ABLATION BASED FAST PROTOTYPING OF FLUIDIC DIODE AND FINGER-DRIVEN MICRODEVICE FOR PRECISE METERING AND DELIVERY OF MULTI-SOURCE LIQUID REAGENTS**

K. Xu\(^1\), M.R. Begley\(^2\), and J.P. Landers\(^1\)

\(^1\)University of Virginia, USA and \(^2\)University of California, Santa Barbara, USA
Tuesday 29 October

08:30 - 08:45  Announcements

08:45 - 09:30  Plenary Presentation IV
COMPUTATIONAL IMAGING, SENSING AND DIAGNOSTICS
Aydogan Ozcan
University of California, Los Angeles, USA

Session 2A1 - Electrokinetic Transport

09:45 - 10:05  HIGH-THROUGHPUT SALT/BIO-AGENT REMOVAL BY ION CONCENTRATION POLARIZATION FOR WATER DESALINATION, PURIFICATION, AND MONITORING
R. Kwak1,2, V.S. Pham1, B.J. Kim1, L. Chen3, and J. Han1,2
1Massachusetts Institute of Technology, USA, 2Korea Institute of Science and Technology (KIST), SOUTH KOREA, 3Singapore-MIT Alliance for Research and Technology (SMART) Centre, SINGAPORE

10:05 - 10:25  NANOFLUIDIC CRYSTAL SENSING AT NORMAL PHYSIOLOGICAL CONDITION BY COUPLING ION CONCENTRATION POLARIZATION
W. Ouyang, J. Sang, Y. Shi, W. Wang, M. Chu, Y. Wang, H. Li, H.A. Zhang, W. Wu, and Z. Li
Peking University, CHINA

10:25 - 10:45  NANOPORES WITH ASYMMETRIC SPACING FOR RESISTIVE-PULSE SENSING OF VIRUS PARTICLES
Indiana University, USA

Session 2B1 - Biomolecular Detection 1

09:45 - 10:05  MEGAHertz-GENERATED FEMTOLITER MICROFLUIDIC DROPLETS FOR SINGLE-MOLECULE-COUNTING IMMUNOASSAYS
J.-U. Shim1,2,3, R.T. Ranasinghe2, F. Hollfelder2, W.T.S. Huck4, D. Klenerman2, C. Abell2, and J. Cooper3
1University of Leeds, UK, 2University of Cambridge, UK, 3University of Glasgow, UK, and 4Radboud University Nijmegen, THE NETHERLANDS

10:05 - 10:25  SIMPLE AND HIGHLY-SENSITIVE ENZYME ACTIVITY ASSAY MICRODEVICE BASED ON THE COMBINATION OF REAGENT-RELEASE HYDROGEL AND CAPILLARY ARRAY
N. Agura, K. Sueyoshi, T. Endo, and H. Hisamoto
Osaka Prefecture University, JAPAN

10:25 - 10:45  NOVEL DETECTION OF NON-ABSORBING MOLECULES BY OPTICAL NEAR-FIELD INDUCED THERMAL LENS MICROSCOPY
University of Tokyo, JAPAN

Session 2C1 - Point-of-Care Immunodiagnostics 1

09:45 - 10:05  A HANDHELD MAGNETIC SENSING PLATFORM FOR ANTIGEN AND NUCLEIC ACID DETECTION
A. Pai1, A. Khachaturian1, S. Chapman1, A. Hu1, H. Wang1, and 2, A. Hajimiri1
1California Institute of Technology, USA and 2Georgia Tech, USA

10:05 - 10:25  A FLUOROGENIC HETEROGENOUS IMMUNOASSAY FOR CARDIAC MUSCLE TROPONIN cTNI ON A DIGITAL MICROFLUIDIC DEVICE
M.-N. Tsaloglou, and H. Morgan
University of Southampton, UK
AN INTEGRATED MICROFLUIDIC SYSTEM FOR RAPID HBA1C MEASUREMENT
C.-C. Wu¹, K.-W. Chang¹, H.-I. Lin², S.-C. Shiesh², and G.-B. Lee¹
¹National Tsing Hua University, TAIWAN and ²National Cheng Kung University, TAIWAN

Session 2A2 - Particle Manufacturing and Encoding

11:15 - 11:35
COMPLEX 3D SHAPED PARTICLE FABRICATION VIA INERTIAL FLOW DEFORMATION AND UV POLYMERIZATION
A.J. Chung¹², C.-Y. Wu¹, D.E. Go¹, J.C. Oka¹, O.H. Paydar¹, R. Candler¹, D. Di Carlo¹
¹University of California, Los Angeles, USA and ²Rensselaer Polytechnic Institute, USA

11:35 - 11:55
STOCHASTIC BARCODING FOR SINGLE-CELL TRACKING
M. Castellarnau, G.L. Szeto, D.J. Irvine, J.C. Love, and J. Voldman
Massachusetts Institute of Technology, USA

11:55 - 12:15
A UNIVERSAL PARTICLE ENCODING ARCHITECTURE
Massachusetts Institute of Technology, USA

Session 2B2 - Biomolecular Detection 2

11:15 - 11:35
OIL-ISOLATED HYDROGEL MICROSTRUCTURES FOR SENSITIVE BIOASSAYS ON-CHIP
R.L. Srinivas, S.D. Johnson, and P.S. Doyle
Massachusetts Institute of Technology, USA

11:35 - 11:55
IMMobilization of Antibodies on Solid-State Surfaces With Controlled Orientation Using Electric Field
M. Javanmard¹, S. Emaminejad¹², C. Gupta², S. Chang², R.W. Davis¹, and R.T. Howe²
¹Stanford Genome Technology Center, USA and ²Stanford University, USA

11:55 - 12:15
MAGNETIC BEAD-ROLLING FOR ULTRASENSITIVE SURFACE-BASED IMMUNOASSAYS
M. Cornaglia, H.C. Tekin, T. Lehnert, and M.A.M. Gijs
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

Session 2C2 - Point-of-Care Immunodiagnostics 2

11:15 - 11:35
A PDMS / PAPER HYBRID MICROFLUIDIC DEVICE INTEGRATED WITH GRAPHENE OXIDE-BASED NANO-BIOSensors FOR MULTIPLEXED PATHOGEN DETECTION
X.J. Li, P. Zuo and D.C. Dominguez
University of Texas, USA

11:35 - 11:55
PAPER MICROFLUIDICS GOES DIGITAL
R. Fobel, A.E. Kirby, and A.R. Wheeler
University of Toronto, CANADA

11:55 - 12:15
IN SITU COCAINE DETECTION IN HUMAN SWEAT USING INTEGRATED DIAGNOSTIC SKINPATCHES AND HAND HELD FLUORESCENCE READER
R. Walczak¹, J. Krüger², S. Moynihan², and D. Flavin²
¹Wroclaw University of Technology, POLAND and ²Biosenisa Ltd., IRELAND
12:15 - 13:15  Lunch
13:15 - 13:35  ACS Young Innovator Award Cerenomy
13:35 - 13:55  Lab-on-a-Chip - Corning Pioneers in Miniaturization Prize
14:00 - 16:00  Poster Session 2

Fundamentals in Microfluidics and Nanofluidics

Wetting, Capillarity, Priming

T.001a  NEW MATHEMATICAL MODEL FOR ELECTROSTATIC STABILITY OF THE CASSIE STATE ON MEMS-BASED PILLARED SURFACE
K.-Y. Song, K. Morimoto, and Y. Suzuki
University of Tokyo, JAPAN

Electrokinetic Phenomena

T.002a  DYNAMICS OF SURFACE CHARGES AND WATER SPLITTING IN MICROCHANNELS CONTAINING NANOPOROUS ION-SELECTIVE MEMBRANES
C.P. Nielsen and H. Bruus
Technical University of Denmark, DENMARK

T.003a  FACILE MICROFLUIDIC BASED METHOD TO DETERMINE EQUILIBRIUM CONSTANTS (K₀) OF REACTING BIOMOLECULES
T.M. Wynne and S. Pennathur
University of California, Santa Barbara, USA

Droplets & Plugs, Multiphase Systems

T.004a  A SURFACE DISPLAYING TECHNOLOGY FOR EFFICIENT APTAMER SELECTION BASED ON HIGHLY PARALLEL SINGLE-MOLECULE EMULSION PCR
Z. Zhu, Y. Song, C. Li, W. Zhang, Z. Guan, and C.J. Yang
Xiamen University, CHINA

T.005a  CHARACTERIZATION OF MICROBUBBLES OF MULTIPLE GASES IN MICROFLUIDIC CHANNELS
A. Bulbul¹, A.S. Basu², and H. Kim¹
¹University of Utah, USA and ²Wayne State University, USA

T.006a  HIGH THROUGHPUT NANODROPLET GENERATION BY USING SPONTANEOUS EMULSIFICATION
M. Fukuyama¹,², and A. Hibara²
¹University of Tokyo, JAPAN and ²Tokyo Institute of Technology, JAPAN

T.007a  MICRO AQUIFORM REACTION-CONTROL CAPSULE – USING TERNARY DROPLET COLLISION TO MODULATE THE CHEMICAL REACTION
S.-I. Yeh, H.-J. Sheen, and J.-T. Yang
National Taiwan University, TAIWAN

T.008a  PARTICLE ORDERING USING DEAN FORCE-BASED INERTIAL MICROFLUIDICS
A. Rane, X. Casadevall i Solvas, and A. deMello
ETH Zürich, SWITZERLAND
SIMPLE GENE TESTING METHOD USING AN AUTOMATED NUCLEIC ACID PURIFICATION DEVICE AND A MICRO CHAMBER ARRAY
A. Yamaguchi1,2, F. Takagi1, K. Kobayashi2, T. Honda3, and Y. Saito1
1Seiko Epson Corporation, JAPAN, 2Shinshu University, JAPAN, and 3Shinshu University Hospital, JAPAN

WIDE RANGE DYNAMIC VOLUME RATIO AND SIZE CONTROL OF MICRODROPLETS USING ACTIVE DROPLET DIVISION DEVICE
Waseda University, JAPAN

FUNCTIONALIZATION OF EMBEDDED THIOL-ENE WAVEGUIDES FOR EVANESCENT WAVE-INDUCED FLUORESCENCE DETECTION IN A MICROFLUIDIC DEVICE
N.A. Feidenhans'l, T.G. Jensen, J.P. Lafleur, and J.P. Kutter
Technical University of Denmark, DENMARK

MANIPULATION OF MICROPARTICLES AND BIOLOGICAL CELLS USING LIGHT-INDUCED MARANGONI FLOW
S.N. Varanakkottu, S.D. George, T. Baier, S. Hardt, M. Ewald, and M. Biesalski
Technische Universität Darmstadt, GERMANY

SINGLE-LAYER MICROFLUIDIC “DISC” DIODES VIA OPTOFLUIDIC LITHOGRAPHY FOR ULTRA-LOW REYNOLDS NUMBER APPLICATIONS
University of California, Berkeley, USA

ON-CHIP FORMATION AND FUSION OF SPHEROIDS BY LABEL-FREE MAGNETIC CELL MANIPULATION
N. Sho, K. Morishima, and Y. Akiyama
Osaka University, JAPAN

DECOUPLING OF ACOUSTIC AND FLUIDIC BOUNDARIES IN ACOUSTOPHORESIS
I. Leibacher, S. Schatzer, and J. Dual
ETH Zürich, SWITZERLAND

DEVELOPMENT OF HEAT-DRIVEN NANOFLOWIC PUMP
Y. Hiramatsu1, C. Wang1,2, H. Shimizu1,2, K. Mawatari1,2, and T. Kitamori1,2
1University of Tokyo, JAPAN and 2Japan Science and Technology Agency (JST), JAPAN

PRESSURE-ASSISTED SELECTIVE ELECTROPRECONCENTRATION IN A STRAIGHT NANOCHEMICAL
A.-C. Louër1, A. Plecis2, A. Pallandre3, and A.-M. Haghiri-Gosnet1
1CNRS, FRANCE, 2Elvesys, FRANCE, and 3Université Paris Sud, FRANCE
Modeling/Numerical Simulation with Experimental Proof

T.018a
DNA FOCUSING IN NANOFLUIDIC CHANNELS
W.L. Hsu¹, M.A. Startsev², D.W. Inglis², E.M. Goldys², M.R. Davidson¹, and D.J.E. Harvie¹
¹University of Melbourne, AUSTRALIA and ²Macquarie University, AUSTRALIA

Others

T.019a
OPTICAL COHERENCE TOMOGRAPHY FOR DIMENSIONAL METROLOGY OF LAB-ON-A-CHIP DEVICES
D.R. Reyes, M. Halter, and J. Hwang
National Institute of Standards and Technology (NIST), USA

Micro- and Nanoengineering

Micro- & Nanofabrication/ -Patterning/ -Integration

T.020b
A LOW-COST, POWER-FREE PDMS MICROFLUIDIC SPOTTER FOR MICROARRAY PRINTING
T. Tang, G. Li, C. Jia, and J. Zhao
Chinese Academy of Sciences, CHINA

T.021b
CREATING MICROMETER-SCALE BRANCH-LIKE PATTERNS THROUGH NANOPILLAR-GUIDED CRYSTALLIZATION
Y.-R. Hsu, E.-C. Chang, C.-C. Fu, C.-M. Cheng, and C.-C. Chen
National Tsing Hua University, TAIWAN

T.022b
ENZYMATIC REACTION-BASED FABRICATION PROCESSES OF MULTILAYER MICROFLUIDIC DEVICES MADE OF GELATIN HYDROGEL
Y. Yajima, E. Yamada, C. Yukita, M. Iwase, M. Yamada, and M. Seki
Chiba University, JAPAN

T.023b
FOCAL MICROFLUIDIC DELIVERY OF SOLUBLE SIGNALS TO THE BASAL SIDE OF MICROPATTERNED CELLS
J. Cheng, C.G. Sip, P.R. Lindstedt, and A. Folch
University of Washington, USA

T.024b
MICROFLUIDIC FLOW REACTORS WITH INTEGRATED MICRO-HEATERS AND FLUORESCENT TEMPERATURE SENSORS FOR REACTION MONITORING
C. Höra¹, Z. Shu², E. Beckert², S. Nagl¹, and D. Belder¹
¹Leipzig University, GERMANY and ²IOF Jena, GERMANY

T.025b
OUT OF CLEANROOM, SELF-ASSEMBLED MAGNETIC ARTIFICIAL CILIA
Y. Wang¹,², Y. Gao¹, H.M. Wyss¹, P.D. Anderson¹, and J.M.J. den Toonder¹
¹Eindhoven University of Technology, THE NETHERLANDS and ²Dutch Polymer Institute, THE NETHERLANDS

T.026b
RAPID PROTOTYPING OF SELF-ALIGNED 3D MICROFLUIDIC STRUCTURES
J. Elizalde, M. Antoñana, L. Matthey, F. Laouenan, and J.M. Ruano-López
CIC microGUNE, SPAIN and IK4-IKERLAN, SPAIN

T.027b
SLURRY PACKING PLACEMENT OF MEMS MICROPARTS ASSISTED WITH GEL MICROCAPSULE
K. Araki¹,², R. Ohashi¹, H. Honma¹, N. Misawa¹, K. Takahashi¹, K. Sawada¹, M. Ishida¹, and Y. Murakami¹,²
¹Toyoohashi University of Technology, JAPAN and ²Japan Science and Technology Agency (JST), JAPAN
Bonding, Sealing & Interfacing Technologies

T.028b
HETEROGENEOUS INTEGRATION OF SILICON FLUIDIC COMPONENTS IN POLYMER CHIPS
M.M. Mielnik, T.R. Tofteborg, E. Andreassen
SINTEF ICT, NORWAY

Novel/Smart/Responsive Materials

T.029b
CONTINUOUS FORMATION OF HOMOGENEOUS AND HETEROGENEOUS HYDROGEL TUBES
A. McAllister and A. Günther
University of Toronto, CANADA

T.030b
MICROCAPSULES WITH MAGNETIC NANOPARTICLE-BASED SHELL AND AQUEOUS CORE VIA SELECTIVE POLYMERIZATION FOR THERAPEUTIC DELIVERY APPLICATIONS
F.N. Pirmoradi, K. Iwai, K.Y. Lee, T.A. Brubaker, and L. Lin
University of California, Berkeley, USA

Surface Modification

T.031b
A CHEMICALLY-SENSITIVE NANOWIRE SENSOR ARRAY FOR SENSING OF H₂O₂ AND pH IN PHYSIOLOGICAL SOLUTIONS
Tel Aviv University, ISRAEL

T.032b
ANTITHROMBOGENICITY OF NANO POROUS POLYETHERSULFONE MEMBRANE COATED WITH FLUORINATED DIAMOND-LIKE CARBON
I. Sanada¹, H. Ito¹, G.S. Prihandana¹, M. Noborisaka¹, N. Miki¹, T. Suzuki¹, and Y. Kanno²
¹Keio University, JAPAN and ²Tokyo Medical University, JAPAN

Molecular Systems & Nanochemistry

T.033b
MANIPULATION OF MICROTUBLES MOTILITY USING ELECTRICAL FILED ON KINESIN/DYNEIN COATED SURFACES
N.K. Kamisetty¹, J. Ikuta¹, H. Shintaku¹, H. Kotera¹, and R. Yokokawa¹,²
¹Kyoto University, JAPAN and ²Japan Science and Technology Agency (JST), JAPAN

T.034b
MULTICHANNEL LINEAR-ARRAY MICROBIOSENSOR USING APTAMER MODIFIED GRAPHENE OXIDE: IMPROVED SENSITIVITY BY MOLECULAR DESIGN
NTT Corporation, JAPAN

Nanobiotechnology

T.035b
DNA TRANSLOCATION DYNAMICS THROUGH SHORT NANOCHANNELS UNDER ASYMMETRIC PULSED ELECTRIC FIELD
C. Gupta, W.-C. Liao, D. Gallego-Perez, C.E. Castro, and L.J. Lee
Ohio State University, USA

T.036b
MICROFLUIDIC SINGLE-MOLECULE NUCLEASE DIGESTION REVEALS RATE-ENHANCING OFF-AND-ON MOLECULAR ENCOUNTERING FUNCTION FOR SITE-SPECIFIC DNA BREAK
D. Onoshima¹, N. Kaji¹, M. Tokeshi², and Y. Baba¹,²
¹Nagoya University, JAPAN and ²Hokkaido University, JAPAN, and
³National Institute of Advanced Industrial Science and Technology (AIST)
Nanoassembly

**T.037b**

**MECHANISM OF DNA COMBING THROUGH RECEDING MENISCUS ASSEMBLY ON MICROSTRUCTURED SUBSTRATE**

B. Charlot¹, F. Bardin¹,², N. Sanchez³, P. Roux³, S. Teixeira³, and E. Schwob⁴

¹Université Montpellier, FRANCE, ²Université de Nîmes, FRANCE, ³SANOFI, FRANCE, and ⁴IGMM CNRS, FRANCE

Sensors & Actuators, Detection Technologies

Micropumps, -Valves, -Dispensers

**T.038c**

**A HIGHLY INTEGRATED DOSING SYSTEM FOR DRUG DELIVERY APPLICATIONS**

F. Thoma, F. Goldschmidtboeing, H. Feth, E. Möller, and P. Woias

*University of Freiburg - IMTEK, GERMANY*

**T.039c**

**ELECTROSTATICALLY DRIVEN VALVELESS PERISTALTIC GAS MICROPUMP WITH MULTIPLE ELECTRODES**

K.S. Lee¹, B. Kim², and M.A. Shannon⁴

¹University of Illinois, Urbana-Champaign, USA and ²Catholic University of Daegu, SOUTH KOREA

**T.040c**

**THERMOREVERSIBLE MODULAR MICROFLUIDIC VALVES USING EMISE IONOGEL**

F. Benito-Lopez¹, M. Antoñana¹, D. Diamond², and V. Castro-Lopez⁴

¹ICIC microGUNE, SPAIN and ²Dublin City University, IRELAND

Physical Sensors

**T.041c**

**A CMOS MEMS CAPACITIVE DIFFERENTIAL FLOW SENSOR FOR RESPIRATORY MONITORING**

W.-J. Chen, S.-H. Liao, and M.-S. Lu

*National Tsing Hua University, TAIWAN*

**T.042c**

**DIRECT DIFFERENTIAL MICRO CORIOLIS MASS FLOW SENSOR TO DETECT THE EFFICIENCY OF A PRECONCENTRATOR SYSTEM**

J. Groenesteijn¹, H. Zhang¹, R.M. Tiggelaar¹, T.S.J. Lammerink¹, J.C. Lötters², J.G.E. Gardeniers¹, and R.J. Wiegerink¹

¹MESA+, University of Twente, THE NETHERLANDS and ²Bronkhorst High-Tech BV, THE NETHERLANDS

**T.043c**

**SIMULTANEOUS FLUORESCENCE AND IMPEDANCE MICRO CYTOMETER – A MODULAR SYSTEM**

D. Spencer, G. Elliott, and H. Morgan

*University of Southampton, UK*

Biosensors

**T.044c**

**A MEMBRANE-BASED SEMIQUANTITATIVE OPTICAL IMMUNOSENSOR WITHOUT TRANSDUCING APPARATUS**

Y.H. Jang, Y.D. Han, B.H. Min, and H.C. Yoon

*Ajou University, SOUTH KOREA*

**T.045c**

**A NOVEL ELECTRICAL NEEDLE WITH MICROELECTRODES FOR REAL-TIME IMPEDANCE MEASUREMENT OF BIOTISSUES**

G. Kang, S. Seo, J. Yun, and J.H. Lee

*Gwangju Institute of Science and Technology (GIST), REPUBLIC OF KOREA*
ULTRA DIELECTROPHORESIS: ELECTROTHERMAL ANALYSIS AND ITS APPLICATIONS IN MICROFLUIDIC SAMPLE PREPARATION AND PROTEOMICS
Stanford University, USA

APTAMER-FUNCTIONALIZED MICROTUBE FOR CONTINUOUS AND SELECTIVE CAPTURING AND FILTERING USING A NANOPOROUS HYDROGEL MEMBRANE
M. Kim and T. Kim
Ulsan National Institute of Science and Technology (UNIST), SOUTH KOREA

CELL TYPE CLASSIFICATION BASED ON SPECIFIC MEMBRANE CAPACITANCE AND CYTOPLASM CONDUCTIVITY USING MICROFLUIDIC DEVICES
Y. Zhao¹, D. Chen¹, Y. Luo¹, S. Huang², H. Lee², M. Wu², R. Long³, J. Wang¹, and J. Chen¹
¹Chinese Academy of Sciences, CHINA, ²Chang Gung University, TAIWAN, ³University of Alberta, CANADA

DEVELOPMENT OF NOVEL LABEL-FREE ENZYME ACTIVITY ASSAY USING NANOIMPRINTED PHOTONIC CRYSTAL FOR UROKINASE ACTIVITY MEASUREMENT
W. Hashimoto, T. Endo, K. Sueyoshi, and H. Hisamoto
Osaka Prefecture University, JAPAN

FABRICATION OF INTEGRATED MICROPATTERN SENSOR CHIP FOR ANALYSIS OF CELL ADHESION DYNAMICS
C.-H. Lee, N. Matsui, and M. Takai
University of Tokyo, JAPAN

KINETIC AND THERMODYNAMIC ANALYSES OF DNA HYBRIDIZATION REVEAL THE MECHANISM OF GOLD NANOPARTICLE-ASSISTED SINGLE BASE-PAIR DISCRIMINATION IN THE NANOBIARRAY CHIP
A. Sedighi and P.C.H. Li
Simon Fraser University, CANADA

METABOLITE ANALYTICS WITH AN INTEGRATED PROTEIN SENSOR ON A MICROFLUIDIC CHIP
S. Ketterer, D. Hoevermann, W. Weber, and M. Meier
University of Freiburg, GERMANY

MULTI-MARKER SCREENING USING NODE-PORE SENSING
K.R. Balakrishnan and L.L. Sohn
University of California, Berkeley, USA

NANOFLUIDIC CRYSTAL IN A PARYLENE C CONFINED SPACE FOR HIGH-CONSISTENT BIOSENSING
B.J. Wang, H. Sun, R. Zhang, W. Wang, M. Chu, Y. Wang, H. Li, H.A. Zhang, W. Wu, and Z. Li
Peking University, CHINA

RAPID AIRBORNE PATHOGENS DETECTION SYSTEM USING DISPOSABLE IMPACTION CARTRIDGE
K. Takenaka¹, S. Togashi¹, and R. Miyake²
¹Hitachi, Ltd., JAPAN and ²University of Tokyo, JAPAN

REAL-TIME BIOSENSOR SYSTEM FOR BIOPHYSICAL MONITORING OF BIRDS
A. Gumus, S. Lee, K. Karlsson, R. Gabrielson, D.W. Winkler, and D. Erickson
Cornell University, USA
T.057c
VOLUMETRIC IMPEDANCE BASED FLOW-THROUGH IMMUNOSENSOR USING AN INTEGRATED ELECTRODE ARRAY AND SILVER ENHANCEMENT
M.S. Wiederoder and D.L. DeVoe
University of Maryland, College Park, USA

Chemical & Electrochemical Sensors

T.058c
PEDOT-CNT COMPOSITE MICRO-ELECTRODES FOR SENSITIVE DETECTION OF NEUROTRANSMITTERS
R. Samba¹, W. Schuhmann², S. Epple¹, I. Matychin¹, L. Kiesel¹, and M. Stelzle¹
¹NMI Natural and Medical Sciences Institute, GERMANY, and ²Ruhr Universität Bochum, GERMANY

T.059c
A NOVEL SPIROPYRAN-CONDUCTING POLYMER BIOSENSOR CHIP WITH ELECTROCHEMICAL AND PHOTOCHEMICAL SENSING PROPERTIES
M. Zanoni¹, R. Gorkin, III², D.L. Officer², K. Wagner², S. Gambhir², G.G. Wallace², and D. Diamond¹
¹Dublin City University, IRELAND and ²University of Wollongong, AUSTRALIA

T.060c
LAB-ON-A-CHIP FOR ELECTROCHEMICAL MAGNETO-IMMUNOASSAY FOR ALZHEIMER’S BIOMARKER DETECTION
M. Medina-Sánchez¹, S. Miserere¹, E. Morales-Narváez¹,², and A. Merkoçi¹,³
¹Autonomous University of Barcelona, SPAIN, ²Polytechnic University of Catalonia, SPAIN, and ³Catalan Institute for Research and Advanced Studies (ICREA), SPAIN

T.061c
MICROFLUIDIC PAPER-BASED ANALYTICAL DEVICE FOR FLUORESCENCE DETECTION OF LACTOFERRIN IN TEAR FLUID
K. Yamada, S. Takaki, K. Suzuki, and D. Citterio
Keio University, JAPAN

Visualization & Imaging Technologies

T.064c
MEASUREMENT OF THREE DIMENSIONAL FLOW STRUCTURE DURING MICRODROPLET FORMATION USING PHASE-LOCKED MULTICOLOR CONFOCAL MICRO-PIV
M. Oishi, H. Kinoshita, T. Fujii, and M. Oshima
University of Tokyo, JAPAN

T.065c
RAMAN IMAGING TECHNIQUE FOR NON-INTRUSIVE VISUALIZATION OF SCALAR DISTRIBUTION IN MICROFLUIDICS
R. Kuriyama, A. Ito, T. Noguchi, K. Ozawa, and Y. Sato
Keio University, JAPAN
Optical Detection

T.066c
A 40-MHZ FREQUENCY MULTIPLEXED ELECTRONIC SYSTEM FOR MULTICOLOR DROPLET FLOW CYTOMETRY
K.M. Dadesh, and A.S. Basu
Wayne State University, USA

T.067c
CARS MICROSCOPIC MEASUREMENT OF MULTIPLE ION CONCENTRATION IN A CHEMICAL REACTION
T. Noguchi, R. Kuriyama, K. Ozawa, and Y. Sato
Keio University, JAPAN

T.068c
DEVELOPMENT OF UV EXCITATION DIFFERENTIAL INTERFERENCE CONTRAST THERMAL LENS MICROSCOPE TOWARD COUNTING OF PROTEIN MOLECULES
Y. Asano\textsuperscript{1}, H. Shimizu\textsuperscript{1,2}, K. Mawatari\textsuperscript{1,2}, and T. Kitamori\textsuperscript{1,2}
\textsuperscript{1}University of Tokyo, JAPAN and \textsuperscript{2}Japan Science and Technology Agency (JST), JAPAN

T.069c
FLUORESCENCE IMAGING OF MOLECULAR TRANSPORTATION THROUGH MEMBRANE PROTEINS USING LIPID BILAYERS ON MICRO-DROPLETS
T. Tonooka\textsuperscript{1}, K. Sato\textsuperscript{1}, R. Kawano\textsuperscript{2}, T. Osaki\textsuperscript{1,2}, and S. Takeuchi\textsuperscript{1,2}
\textsuperscript{1}University of Tokyo, JAPAN and \textsuperscript{2}Kanagawa Academy of Science and Technology (KAST), JAPAN

T.070c
MICRO/NANO SURFACE TENSION MEASUREMENT BY 2D-CAPILLARY WAVE RESONANCE
M. Chung\textsuperscript{1,2}, C. Pigot\textsuperscript{3}, and A. Hibara\textsuperscript{2}
\textsuperscript{1}University of Tokyo, JAPAN, \textsuperscript{2}Tokyo Institute of Technology, JAPAN, and \textsuperscript{3}LIMMS-CNRS, JAPAN

T.071c
PLASTICIZED PVC-BASED PHOTONIC CRYSTAL FOR ION SENSING APPLICATION
S. Aki, T. Endo, K. Sueyoshi, and H. Hisamoto
Osaka Prefecture University, JAPAN

Mass Spectrometric Detection

T.072c
INTERFACING DROPLET MICROFLUIDICS WITH INDUCTIVELY COUPLED PLASMA MASS SPECTROMETRY
P.E. Verboket, O. Borovinskaya, D. Günther, and P.S. Dittrich
ETH Zürich, SWITZERLAND

Novel Functionalities in Integrated Microfluidic Platforms

Platforms Based on Capillary Forces (Paper Based Microfluidics, Lateral Flow Tests)

T.073d
FABRICATION OF LAMINATED PAPER-BASED ANALYTICAL DEVICES (LPAD) FOR COTININE DETECTION
Z.H. Fan\textsuperscript{1}, C.L. Cassano\textsuperscript{1}, and W. Liu\textsuperscript{1,2}
\textsuperscript{1}University of Florida, USA and \textsuperscript{2}Shaanxi Normal University, CHINA

T.074d
PLASMONIC NANOPARTICLE DEPOSITION ON A MICROPILLAR ARRAY AS A 3D NANOSENSOR
C. Huang, H. Jans, N. Verellen, M. Bivragh, and L. Lagae
IMEC, BELGIUM
T.075d
SLICED THREAD COMPOSITE FOR LOW-COST MULTIPLEXED IMMUNOASSAY
J. Kim, S. Bae, S. Song, and S. Kwon
Seoul National University, SOUTH KOREA

Microfluidic Large Scale Integration

T.076d
ROBUST LAYOUT TECHNIQUES DECREASE VOLUME INJECTION AND CAPACITIVE MISMATCH DUE TO ALIGNMENT ERRORS
F. Yu, M.A. Horowitz, and S.R. Quake
Stanford University, USA

Digital Microfluidics on Surfaces

T.077d
PARTIALLY FILLED ELECTRODES FOR DIGITAL MICROFLUIDIC DEVICES
D.G. Pyne1, W.M. Salman2, M. Abdelgawad2, and Y. Sun1
1University of Toronto, CANADA and 2Assiut University, EGYPT

Segmented Flow & Droplet Based Microfluidics in Channels

T.078d
A HIGH-THROUGHPUT MICROFLUIDIC SYSTEM FOR THE SIMULTANEOUS FORMATION OF DROPLET-INTERFACE-BILAYER ARRAYS
B. Schlicht and M. Zagnoni
University of Strathclyde, UK

T.079d
DROPLET ARRAY FOR MINIATURIZING MICROTITER PLATE PLATFORM
S.H. Jin1, H.-H. Jeong1, Y.M. Noh1, S.-H. Lee2, and C.-S. Lee1
1Chungnam National University, SOUTH KOREA and 2Korea Institute of Science and Technology (KIST), SOUTH KOREA

Centrifugal Microfluidics

T.080d
A NOVEL FULLY AUTOMATED CENTRIFUGAL MICROFLUIDIC PLATFORM WITH MASSIVE VOLUME CAPABILITY TO ISOLATE CIRCULATING TUMOR CELLS
M.S. Kim1, H.-S. Moon1, S.S. Kim2, J.-M. Park1, and N. Huh1
1Samsung Advanced Institute of Technology (SAIT), SOUTH KOREA and 2Samsung Electronics, SOUTH KOREA

T.081d
DEVELOPMENT OF A ROTATABLE REAGENT CARTRIDGE FOR HIGH-PERFORMANCE MICROVALVE SYSTEM ON A CENTRIFUGAL MICROFLUIDIC DEVICE
National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

T.082d
INTEGRATION OF CENTRIFUGO-MAGNETOPHORESIS AND BRIGHT-FIELD BASED T-CELL ENUMERATION FOR HIV DIAGNOSTICS IN RESOURCE-POOR SETTINGS
M. Glynn, D. Kirby, R. Burger, and J. Ducrée
Dublin City University, IRELAND
**T.085d**

**MIXING BY ON-CHIP GENERATED GAS BUBBLES FOR ASSAY AUTOMATION IN STANDARD LABORATORY CENTRIFUGES**

J. Liebeskind¹, A. Kloke¹, A.R. Fiebach¹, F. von Stetten¹², R. Zengerle¹²³, and N. Paust¹²

¹Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY, ²University of Freiburg – IMTEK, GERMANY, and ³University of Freiburg – BIOSS, GERMANY

**Electrokinetic Microfluidics**

**T.086d**

**DIELECTROPHORESIS-BASED 3D CELL ROTATION THROUGH INTEGRATION OF BOTTOM AND VERTICAL ELECTRODES**

P. Benhal¹, J.G. Chase¹, P. Gaynor¹, B. Oback², and W.H. Wang³

¹University of Canterbury, NEW ZEALAND, ²Agresearch, NEW ZEALAND, and ³Tsinghua University, CHINA

**T.087d**

**SIMPLE AND RAPID IMMUNOASSAY USING MICRO ISOELECTRIC FOCUSING DEVICE AND REAGENT RELEASE HYDROGELS**

Y. Fujii, K. Sueyoshi, T. Endo, and H. Hisamoto

Osaka Prefecture University, JAPAN

**Other & Novel Microfluidic Platforms**

**T.088d**

**CELL VIBRO-DEFORMABILITY**

S. Sakuma¹, K. Kuroda¹, F. Arai², and M. Kaneko¹

¹Osaka University, JAPAN and ²Nagoya University, JAPAN

**T.089d**

**DIELECTROPHORETIC TRAPPING OF BEADS IN COMPACT CAPILLARY-DRIVEN SYSTEMS WITH MULTIWALL ELECTRODES**

Y. Temiz, G.V. Kaigala, and E. Delamarche

IBM Research - Zurich, SWITZERLAND

**T.090d**

**EXTRUDED MICROFLUIDIC IMMUNOASSAYS**

A.I. Ferreira¹, A.P. Castanheira², R.G. Chahin³, M.R. Mackley³, A.D. Edwards⁴, and N.M. Reis¹

¹Loughborough University, UK, ²Capillary Film Technology Ltd, UK, ³University of Cambridge, UK, and ⁴Reading University, UK

**T.091d**

**MULTIPLEXED ELECTRICAL IMPEDANCE SPECTROSCOPY FOR CONTINUOUS MONITORING OF MICROTISSUES IN A GRAVITY-DRIVEN FLOW**

J.-Y. Kim, S. Bürgel, A. Hierlemann, and O. Frey

ETH Zürich, SWITZERLAND

**T.092d**

**pH MANIPULATING IN MICROFLUIDIC CHIPS BASED ON PALLADIUM FILM PROTON PUMP**

D. Zhang, D. Hu, Z. Luo, B. Mao, and Y. Zhou

Xiamen University, CHINA

**T.093d**

**THREE DIMENSIONAL HYDRODYNAMIC FLOW AND PARTICLE FOCUSING THROUGH FOUR VORTICES DEAN FLOW**


Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA
Cells & Liposomes on Chip

Cell Capture, Counting, & Sorting

T.094e
SINGLE LAYERED “MICROFLUIDIC DRIFTING” BASED 3D HYDRODYNAMIC FOCUSING REACHING SUBMICROMETER PRECISION
A.A. Nawaz¹, X. Mao¹, P. Li¹, J. Rufo¹, L. Wang², and T.J. Huang¹
¹Pennsylvania State University, USA and ²Ascent Bio-Nano Technologies Inc., USA

T.095e
ASSEMBLY OF CELL-LADEN MICROGELS BY AN OPTICALLY CONTROLLED BUBBLE MANIPULATOR
W. Hu, Q. Fan and A.T. Ohta
University of Hawaii, USA

T.096e
CONTINUOUS AND LABEL-FREE MICROFLUIDIC CELL SEPARATION
T.M. Geislinger, B. Eggart, S. Braunmüller, L. Schmid, and T. Franke
University of Augsburg, GERMANY

T.097e
A MICROFLUIDIC DEVICE FOR BLOOD CELL SORTING AND MORPHOLOGY ANALYSIS
V. Liu¹, M. Patel ², and A. Lee²
¹Flintridge Preparatory School and USA, ²University of California, Irvine, USA

T.098e
MICROFLUIDIC CELL SORTER AIDED DIRECTED EVOLUTION OF AN IMPROVED FLUORESCENT PROTEIN-BASED CALCIUM INDICATOR
Y. Zhao, H. Hoi, R.E. Campbell, and D.J. Harrison
University of Alberta, CANADA

T.099e
CELL CULTURE AND FRACTIONATION ON A MICROFLUIDIC CHIP WITH PROGRAMMABLE MODULES OF TEMPERATURE AND CARBON DIOXIDE
National Taiwan University, TAIWAN

Circulating Tumor Cells

T.100e
A LABEL-FREE SIZE-BASED MICRO COULTER COUNTER SYSTEM FOR CIRCULATING RARE TUMOR CELLS
H. Choi¹, C.S. Jeon¹, H.K. Kim², T.D. Chung², and H.C. Kim²
¹Seoul National University, SOUTH KOREA and ²National Cancer Center, SOUTH KOREA

T.101e
FOLIC ACID COUPLED POLY(L-LYSINE)-GRAFT-(POLY(2-METHYL-2-OXAZOLINE) (FA-C-PLL-G-PMOXA): A NOVEL COPOLYMER FOR SPECIFIC TARGETING TO FOLATE RECEPTOR-POSITIVE TUMOR CELLS
Y. Chen, W. Cao, W. Wen, I.-M. Hsing, and H. Wu
Hong Kong University of Science & Technology, HONG KONG SAR, CHINA

T.102e
MICROFLUIDIC VORTEX TECHNOLOGY FOR PURE CIRCULATING TUMOR CELL CONCENTRATION FROM PATIENT BLOOD
J. Che¹, E. Sollier¹,², D.E. Go₁,², N. Kummer³, M. Rettig³, J. Goldman³, N. Nickols³, S. McCloskey³, R.P. Kulkarni³, and D. Di Carlo¹
¹University of California, Los Angeles, USA, ²Vortex Biosciences, USA, and ³University of California, Los Angeles Medical Center, USA
Single Cell Analysis

T.104e
AUTOMATED HIGH-THROUGHPUT MICROSYSTEM FOR TUNABLE TEMPORAL STIMULATION AND ANALYSIS OF NON-ADHERENT CELLS
L. He, A. Kniss, M.L. Kemp, and H. Lu
Georgia Institute of Technology, USA

T.105e
DEVELOPMENT OF VOLUME INTERFACE BETWEEN CELL AND ANALYSIS METHOD UTILIZING THE AIR-LIQUID TWO-PHASE FLOW FOR SINGLE CELL ANALYSIS
M. Kumagai1, K. Jang1, K. Mawatari1,2, and T. Kitamori1,2
1University of Tokyo, JAPAN and 2Japan Science and Technology Agency (JST), JAPAN

T.106e
INTEGRATED MICROFLUIDIC DEVICE FOR COUPLED PROTEIN EXPRESSION AND DRUG RESPONSE ON INDIVIDUAL CANCER CELLS
G. Amselem1, R. Tomasi1, R. Frohlich2, Y.-P. Ho2, B.R. Knudsen2, and C.N. Baroud1
1Ecole Polytechnique, FRANCE and 2Aarhus University, DENMARK

T.107e
MEASUREMENT OF ELECTROPORATION INDUCED CHANGES IN THE DIELECTRIC RESPONSE OF SINGLE CELLS
E. Salimi, K. Braasch, V. Jung, M. Butler, D.J. Thomson, and G.E. Bridges
University of Manitoba, CANADA

T.108e
NANO-INTENSIFIED ELECTRIC FIELD FOR MULTI-LOCALIZED SINGLE CELL ELECTROPORATION
T.S. Santra1, P.-C. Wang1, and F.-G. Tseng1,2
1National Tsing Hua University, TAIWAN and 2Academia Sinica, CHINA

T.109e
PROTEIN IDENTIFICATION AND QUANTIFICATION FOR SINGLE CELL ANALYSIS BY COUPLING A MICROFLUIDIC PLATFORM WITH MALDI-TOF
M. Yang, T.-C. Chao, R. Nelson, and A. Ros
Arizona State University, USA

T.110e
SINGLE CELL PUNCTURE WITH OPTICALLY MANIPULATED HYBRID NANOROBOT
T. Hayakawa and F. Arai
Nagoya University, JAPAN

T.111e
TOWARDS QUANTITATIVE ANALYSIS OF SINGLE E.COLI LYSATES
S. Stratz, K. Eyer, F. Kurth, and P.S. Dittrich
ETH Zürich, SWITZERLAND

Liposomes/Vesicles

T.112e
MANIPULATION OF LIPOSOME-BASED BIOREACTOR FEATURING ADDING, MIXING AND ALIQUOTING FEMTOLITER VOLUMES
H. Shiomi1, S. Tsuda2,3, H. Suzuki3,4, and T. Tomo1,3
1Osaka University, JAPAN, 2University of Glasgow, UK, 3Japan Science and Technology Agency (JST), JAPAN, and 4Chuo University, JAPAN
T.113e
REORGANIZATION OF LIPID DOMAINS IN MODEL MEMBRANES UNDER DEFORMATION
T. Robinson, P. Kuhn, and P.S. Dittrich
ETH Zürich, SWITZERLAND

Stem Cells

T.114e
HUMAN INDUCED PLURIPOTENT STEM (iPS) CELLS-DERIVED NEURAL STEM CELL BUNDLE COVERED WITH GROWTH FACTOR-ENCAPSULATED AMPHIPHILIC CHITOSAN
M. Kato-Negshi1,2, H. Onoe1,2, S. Iwanaga1,2, Y. Kobayashi1, M. Nakamura1, H. Okano1, and S. Takeuchi1,2
1University of Tokyo, JAPAN, 2Japan Science and Technology Agency (JST), JAPAN and 3Keio University, JAPAN

Cell-Surface Interaction

T.115e
CELL ADHESION CONTROL INITIATE CELL SHEET FORMATION IN A MEDIUM SUSPENSION
K.O. Okeyo1, N. Omasa1, O. Kurosawa1, H. Oana1, H. Kotera2, and M. Washizu1
1University of Tokyo, JAPAN and 2Kyoto University, JAPAN

T.116e
MICROFABRICATED PLATFORM FOR THE APPLICATION OF GRADIENT BIAXIAL STRAIN TO CELLS
M.G. Simon, M. Winkler, T. Vu, T. Gartner, J.V. Jester, and A.P. Lee
University of California, Irvine, USA

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

T.117e
A MICROFLUIDIC PLATFORM TO GENERATE A ROBUST GAS-LIQUID INTERFACE FOR ORGANOTYPIC SLICE CULTURE OVER A LONG PERIOD
G.N. Kanda1,2, H. Moriguchi2, R.G. Yamada2, Y. Tanaka1,2, and H.R. Ueda1,2,3
1Osaka University, JAPAN, 2RIKEN, JAPAN, and 3University of Tokyo, JAPAN

T.118e
A MICRODEVICE TO SCREEN BIOMOLECULE TRANSPORT ACROSS THE PULMONARY EPITHELIAL BARRIER
L. Bol1, J.-C. Galas2, H. Hillaireau1, I. Le Potier1, A.-M. Haghiri-Gosnet2, E. Fattal1, and M. Taverna1
1Institut Galien Paris Sud, FRANCE and 2CNRS, FRANCE

T.119e
HIGH DENSITY HYDROGEL ARRAYS FOR 3D CELL COLONIES WITH DYNAMICALLY CONTROLLED EXTERNAL STIMULI
R. Tomasi, G. Amselem, and C.N. Baroud
Ecole Polytechnique, FRANCE

T.120e
MICROFLUIDIC PERFUSION CULTURE OF HUMAN INDUCED PLURIPOTENT STEM CELL IN MICROCHAMBER ARRAY CHIP
R. Yoshimitsu1, K. Hattori1, S. Sugiiura2, Y. Kondo1, T. Satoh2, A. Kurisaki2, M. Asashima2, K. Ohnuma1, and T. Kanamori1
1Nagaoka University of Technology, JAPAN and 2National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

Inter- & Intracellular Signaling, Cell Migration

T.121e
A MICROFLUIDIC INVASION ASSAY FOR GLIOMA-INITIATING CELLS IN THREE-DIMENSIONAL CULTURE
S. Fujioka, S. Oltea, H. Saya, and R. Sudo
Keio University, JAPAN
T.122e
COLLECTIVE MIGRATION OF SMALL-SIZED MULTI-CELLULAR CLUSTERS STUDIED BY DYNAMIC CELL MICRO-PATTERNING BASED ON A CELL-FRIENDLY PHOTORESIST
J.-C. Choi, H.-R. Jung, and J. Doh
Pohang University of Science and Technology (POSTECH), SOUTH KOREA

T.123e
NUMERIC MODELING OF CELL-CELL SIGNALING IN MICROFLUIDICS TOWARDS IN VITRO MODELS OF INTESTINAL FLORA
X.L. Luo¹, G.W. Rubloff², and W.E. Bentley²
¹Catholic University of America, USA and ²University of Maryland, USA

Microfluidics for Cryopreservation

T.124e
THERMOPLASTIC BURST VALVES ENABLING ON-CHIP CRYOPRESERVATION AND REAGENT PACKAGING
O. Rahmanian¹, C.-F. Chen², and D.L. DeVoe¹
¹University of Maryland, College Park, USA and ²National Chung Hsing University, TAIWAN

Others

T.125e
MULTIPARAMETRIC TUMOR CELL CULTURE MONITORING WITH A NOVEL MICROSENSOR SYSTEM
A. Weltin¹, K. Slastowski¹, J. Kieninger¹, J. Moser², G. Jobst³, R. Ehrer³, and G.A. Urban¹
¹University of Freiburg - IMTEK, GERMANY, ²Jobst Technologies GmbH, GERMANY, and ³Bionas GmbH, GERMANY

T.126e
ROTATION OF CELLS AND CELL CLUSTERS IN CULTURE MEDIA FOR OPTICAL COMPUTED TOMOGRAPHY
Arizona State University, USA

Organs & Organisms

Organs on Chip

T.127f
DEVELOPMENT OF AN EX-VIVO LYMPHATIC VASCULAR MODEL
M. Sato¹, N. Sasaki², K. Sato¹, S. Hirakawa¹, and K. Sato¹
¹Japan Women’s University, JAPAN, ²Toyo University, JAPAN, ³Gunma University, JAPAN, and ⁴Hamamatsu University School of Medicine, JAPAN

T.128f
MICROFLUIDIC SYSTEM FOR MIMICKING INTERACTIONS BETWEEN PANCREAS AND PERIPHERAL TISSUES
R. Dhumpa, T.M. Truong, X. Wang, and M.G. Roper
Florida State University, USA

T.129f
THREE-DIMENSIONAL MICROVESSEL ARRAY FOR VASCULAR PERMEABILITY ASSAY
H. Lee, S. Kim, M. Chung, and N.L. Jeon
Seoul National University, SOUTH KOREA

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

T.130f
OCEAN ON A CHIP: MICROFLUIDICS AS A GATEWAY TO FUNCTIONAL MARINE ECOLOGY
N. Ramanathan*, O. Simakov*, C.A. Merten, and D. Arendt
European Molecular Biology Laboratory (EMBL), GERMANY
Diagnostics & Analytics

Sample Preparation (Whole blood, Saliva, Cells, Tissue, Food, etc.)

T.131g
A MICROFLUIDIC SAMPLE PREPARATION DEVICE FOR PRE-CONCENTRATION AND CELL LYSIS USING A NANOPOROUS MEMBRANE
M.S. Islam, K. Kuryllo, P.R. Selvaganapathy, Y. Li, and M.J. Deen
McMaster University, CANADA

T.132g
ACOUSTIC TRAPPING FOR BACTEREMIA DIAGNOSIS WITH MALDI-MS
B. Hammarström1, B. Nilsson2, T. Laurell1,3, J. Nilsson1, and S. Ekström1
1Lund University, SWEDEN, 2Labmedicin Skåne, SWEDEN, and 3Dongguk University, SOUTH KOREA

T.133g
HIGH-EFFICIENCY CELL ENRICHMENT USING STANDING SURFACE ACOUSTIC WAVE BASED CELL TRAPPING
Y. Chen, S. Li, Y. Gu, P. Li, X. Ding, and T.J. Huang
Pennsylvania State University, USA

T.134g
PAPER MICROFLUIDIC EXTRACTION OF BACTERIAL AND VIRAL NUCLEIC ACID FROM FIELD AND CLINICAL SAMPLES TOWARDS A DIRECT MICROTAS APPARATUS
C.F. Fronczek, T.S. Park, and J.-Y. Yoon
University of Arizona, USA

Nucleic Acid Analysis (e.g. Digital PCR, Next Generation Sequencing)

T.135g
CONTROL OF DNA TRANSLOCATION VELOCITIES FOR NANOPORE-BASED DNA SEQUENCING
X. Sun1, T. Yasui1, S. Rahong2, T. Yanagida2, N. Kaji1, M. Kanai2, K. Nagashima2, T. Kawai2, and Y. Baba1,3
1Nagoya University, JAPAN, 2Osaka University, JAPAN, and
3National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

T.136g
BEAD-BASED MELTING ANALYSIS IN TEMPERATURE-GRADIENT MICROCHANNELS FOR SINGLE NUCLEOTIDE POLYMORPHISMS DETECTION
National Taiwan University, TAIWAN

T.137g
LABEL-FREE DETECTION AND QUANTIFICATION OF REAL-TIME DNA AMPLIFICATION USING ONE-DIMENSIONAL PHOTONIC CRYSTAL
T. Yasui1, K. Ogawa1, N. Kaji1, M. Nilsson2, M. Tokeshi1,3, Y. Horiike4, and Y. Baba1,5
1Nagoya University, JAPAN, 2Stockholm University, SWEDEN, 3Hokkaido University, JAPAN, and
4National Institute for Materials Science, JAPAN, and
5National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

T.138g
MULTIPLEX LIGATION-DEPENDENT PROBE AMPLIFICATION (MLPA) ON-CHIP
S. Peeters1, B. Jones1, O. Ibrahim1,3, R. Wiederkehr1, L. Zhang1, H. Tanaka4, T. Matsuno4, I. Yamashita4,
B. Majeed1, T. Stakenborg1, P. Fiorini1, and L. Lagae1
1IMEC, BELGIUM, 2Alexandria University, EGYPT, 3Centre of Excellence for Nano-manufacturing Applications (CENA), SAUDI ARABIA, and 4Panasonic Corporation, JAPAN

T.139g
SINGLE-MOLECULE COUNTING WITH MICROFLUIDICS, DIGITAL ISOTHERMAL AMPLIFICATION, AND A MOBILE PHONE IS MORE ROBUST THAN KINETIC BASED REAL-TIME QUANTIFICATION
D.A. Selck, M.A. Karymov, B. Sun, and R.F. Ismagilov
California Institute of Technology, USA
Protein Analysis & Characterization (e.g. Proteomics)

T.140g
COST-EFFECTIVE MULTIPLEXED IMMUNOASSAYS USING SILVER PRECIPITATION AND A DESKTOP SCANNER
G. Zhou, S. Bergeron, and D. Juncker
McGill University, CANADA

T.141g
MICROFLUIDIC DEVICES TO MAP PROTEIN PHASE DIAGRAMS AND NUCLEATION KINETICS FOR IN SITU X-RAY DIFFRACTION OF PROTEIN CRYSTALS
M. Heymann, A. Opathalage, M. Ludwig, and S. Fraden
Brandeis University, USA

T.142g
MULTIPLEX ANALYSIS OF CARBOHYDRATE/PROTEIN COMPLEX FOR NEUROBLASTOMA CELLS
F. Pastorino2 and G. Simone1
2Istituto G. Gaslini, ITALY and 1University of Napoli, ITALY

Clinical Chemistry

T.143g
A RAPIDLY RECONFIGURABLE, UNIVERSAL POINT-OF-CARE TEST PLATFORM
J. Kai1, A. Puntambekar1, S.H. Lee1, J. Han1, and C.H. Ahn1,2
1Siloam Biosciences, USA and 2University of Cincinnati, USA

T.144g
CHARACTERIZATION OF SHORT INCUBATION TIME EFFECTS ON CHROMOGEN SIGNAL OBTAINED BY HER2-EXPRESSING BREAST CARCINOMAS USING MICROFLUIDIC IMMUNOHISTOCHEMISTRY
A.T. Ciftlik1, H.-A. Lehr1,2, and M.A.M. Gijs1
1École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND,
2Universitaire Vaudoise (CHUV), SWITZERLAND, and 3Universite de Lausanne, SWITZERLAND

T.145g
SINGLE-STEP, MULTI-PARAMETER MONITORING OF LIVER FUNCTION ON A PORTABLE CENTRIFUGAL ANALYZER
C.E. Nwankire, M. Czugala, R. Burger, D. Diamond, and J. Ducrée
Dublin City University, IRELAND

Others

T.146g
A MICROFLUIDIC ARCHITECTURE FOR EFFICIENT REAGENT INTEGRATION, REAGENT RELEASE AND ANALYTE DETECTION IN LIMITED SAMPLE VOLUME
B. Eker, M. Hitzbleck, R.D. Lovchik, Y. Temiz, and E. Delamarche
IBM Research GmbH, SWITZERLAND

T.147g
PHASEGUIDE ASSISTED LIQUID LAMINATION FOR MAGNETIC BEAD-BASED ASSAYS
C. Phurimsak1, E. Yildirim2,3, S.J. Trietsch2,4, T. Hankemeier2, M.D. Tarn1, N. Pamme1, and P. Vulto2,4
1University of Hull, UK, 2University of Leiden, THE NETHERLANDS, 3Cankaya University, TURKEY, and 4MIMETAS VB, THE NETHERLANDS
Circulating Tumor Cell (CTC) Enrichment: Ultra High Throughput Processing of Clinically Relevant Blood Volumes Using a Multiplexed Spiral Biochip

M.E. Warkiani, B.L. Khoo, D.S.W. Tan, A.S. Bhagat, W.T. Lim, J. Han, and C.T. Lim

National University of Singapore, Singapore, National Cancer Centre Singapore, Singapore, ClearbridgeBioMedics Pte Ltd., Singapore, and Massachusetts Institute of Technology, USA

Microfluidic Liposomes Targeting Hypoxia Induced Tumor Progression


University of Maryland, Baltimore, USA and National Institute of Standards and Technology (NIST), USA

Real Time Bio Mechanical Characterization of DNA Damage Under Therapeutic Radiation Beams

G. Perret, T. Lacornerie, M. Kumemura, N. Lafitte, H. Guillou, L. Jalabert, E. Lartigau, T. Fujii, F. Cleri, H. Fujita, and D. Collard

LIMMS-CNRS-IIS, Japan, University of Lille 2, France, University of Lille 1, France, and University of Tokyo, Japan

Development of 3rd Generation Immunopillar Device for High Sensitive Detection of Disease Markers

N. Nishiwaki, T. Kasama, A. Ishida, H. Tani, Y. Baba, and M. Tokeshi

Hokkaido University, Japan, Nagoya University, Japan, The Priority Research Project, Japan

Towards Personalized Mental Healthcare: An Electrochemically-Amplified Biosensor for Clozapine Antipsychotic Treatment Monitoring


University of Maryland, College Park, USA and University of Maryland School of Medicine, USA

High Throughput Purification Devices for In Vivo Applications of Gene-Delivery Multifunctional Envelope-Type Nanodevices


Nagoya University, Japan, Hokkaido University, Japan, and National Institute of Advanced Industrial Science and Technology (AIST), Japan

Multiphase-Laden Gas-Liquid Interface Injection for the Versatile Gene Transfer


Nagoya University, Japan, Shibaura Institute of Technology, Japan, and Osaka University, Japan

Continuous Manufacturing of Robust Living Fibers That Withstand Common Textile Processing for Tissue Engineering Applications

M. Akbari, A. Tamayol, V. Laforte, N. Annabi, A. Khademhosseini, and D. Juncker

McGill University, Canada, Harvard-MIT Division of Health Sciences and Technology, USA, and Brigham and Women’s Hospital, Harvard Medical School, USA
T.156h
**IN SITU CROSSLINKABLE HYDROGEL FOR RAPID ENGINEERING OF VASCULAR-LIKE STRUCTURES**
BY USING ELECTROCHEMICAL DETACHMENT OF CELLS
T. Kageyama1,2, T. Kakegawa1,2, T. Osaki1,2, T. Ito3, T. Nittami2, and J. Fukuda2
1University of Tsukuba, JAPAN, 2Yokohama National University, JAPAN, and 3University of Tokyo, JAPAN

T.157h
**PANCREATIC BETA-CELL-LADEN CONTACT LENS BASED ON TETRA-PEG FOR DIABETES TREATMENT**
Y.J. Heo, S. Iwanaga, and S. Takeuchi
University of Tokyo, JAPAN and Japan Science and Technology Agency (JST), JAPAN

Implantable and Surgical Microdevices

T.158h
**MECHANICAL INTERACTION BETWEEN SINGLE-SHAFT SILICON MICROELECTRODES AND RAT DURA MATER**
Z. Fekete, A. Németh, G. Márton, I. Ulbert, P. Fürjes, and A. Pongrácz
Hungarian Academy of Sciences, HUNGARY

Devices for Better Quality-of-Life (QOL)

T.159h
**AN ARTIFICIAL LUNG BASED ON GAS EXCHANGE AND BLOOD FLOW OPTIMIZATIONS**
T. Rieper1, P. Čvančara1, S. Gast2, B. Wehrstein2, A.N. Maurer2, C. Mueller1, and H. Reinecke1
1University of Freiburg - IMTEK, GERMANY and 2Novalung GmbH, GERMANY

T.160h
**SIMULTANEOUS PROBING OF SINGLE ERYTHROCYTE BIOCHEMICAL AND MECHANICAL PROPERTIES FOR EFFICIENT BLOOD TRANSFUSION**
S. Huang, H.W. Hou, and J. Han
Massachusetts Institute of Technology, USA

Neurobiology/Neuroscience

T.161h
**STUDYING AXON PATHFINDING IN CONTROLLED MICROFLUIDIC ENVIRONMENTS**
S. Moorjani, N. Bhattacharjee, and A. Folch
University of Washington, USA

Separation Technologies

Electrophoretic Separations

T.162i
**CAPILLARY ISOELECTRIC FOCUSING ON SLIPCHIP**
S. Wang and W. Du
Renmin University of China, CHINA

T.163i
**DEVELOPMENT OF MICROFLUIDIC BLOTTING DEVICES USING ALGINATE HYDROGEL**
Y. Fukushima1, T. Naito1, K. Suyoshi2, T. Kubo1, and K. Otsuka1
1Kyoto University, JAPAN and 2Osaka Prefecture University, JAPAN

T.164i
**EFFECT OF INTERMITTENT AND HIGH FIELD ON TRAPPING OF MEGABASE-SIZED DNA UNDER ASYMMETRIC PULSED FIELD IN NANOPOROUS STRUCTURES ON CHIP**
H. Sheng1 and D.J. Harrison1,2
1University of Alberta, CANADA and 2National Institute for Nanotechnology, CANADA
T.165i
HIGH-SPEED MICRO-RNA ISOLATION FROM DNA FRAGMENTS BY NANOPILLER ARRAY CHIP
Q. Wu1, T. Yasui1, S. Rahong2, T. Yanagida1, M. Kanai2, N. Kaji1, M. Tokeshi3, K. Nagashima1, T. Kawai1, and Y. Baba1,4
1Nagoya University, JAPAN, 2Osaka University, JAPAN, 3Hokkaido University, JAPAN, and 4National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

T.166i
INTEGRATION OF FLUORESCENT pH SENSORS IN MICROFLUIDIC FREE-FLOW ISOELECTRIC FOCUSING PLATFORMS USING AUTOMATED INKJET PRINTING
C. Herzog1, E. Beckert2, and S. Nagl1
1Leipzig University, GERMANY and 2IOF Jena, GERMANY

T.167i
RATCHET NANOFILTRATION OF DNA
J.D.P. Thomas1, D.W. Olson1, M.N. Joswiak1,2, S.-G. Park3, and K.D. Dorfman1
1University of Minnesota, USA, 2University of California, Santa Barbara, USA, and 3Korea Institute of Materials Science, SOUTH KOREA

Chromatographic Separations

T.168i
ATTOLITER CHROMATOGRAPHY AND DETECTION FOR NONFLUORESCENT BIOMOLECULES TOWARD SINGLE CELL ANALYSIS
H. Shimizu, A. Smirnova, K. Mawatari, and T. Kitamori
University of Tokyo and Japan Science and Technology Agency (JST), JAPAN

T.169i
TEMPERATURE OPTIMIZED DNA CHROMATOGRAPHY IN A VAPOR PHASE FUNCTIONALIZED SILICON MICROPILLAR ARRAY CHIP
L. Zhang1,2, P. Fiorini1, B. Majeed1, L. Lagae1,2, C. Van Hoof1,2, B. Jones1, and W. De Malsche3
1IMEC, BELGIUM, 2Katholieke Universiteit Leuven, BELGIUM, and 3Vrije Universiteit Brussel, BELGIUM

Particle Separations

T.170i
CONTINUOUS CONCENTRATOR FOR NANOPARTICLE BASED ON CASCADE AC ELECTROOSMOTIC FLOW
K. Yamasaki and M. Motosuke
Tokyo University of Science, JAPAN

T.171i
COMBINED DENSITY AND SIZE-BASED SORTING IN DETERMINISTIC LATERAL DISPLACEMENT DEVICES
S.H. Holm, J.P. Beech, and J.O. Tegenfeldt
Lund University, SWEDEN

Microreaction Technology & Synthesis

Microreactors & Micromixers

T.172j
ACOUSTOFLUIDIC MICROMIXER USING ACOUSTICALLY OSCILLATED SHARP-EDGES
P.H. Huang1, Y. Xie1, D. Ahmed1, N. Nama1, Y. Chao1, C.Y. Chan1, L. Wang2, and T.J. Huang1
1Pennsylvania State University, USA and 2Ascent Bio-Nano Technologies Inc., USA

T.173j
INVESTIGATION OF BURSTING OF HEATED DROPLETS FOR CHEMISTRY APPLICATIONS IN DIGITAL MICROFLUIDICS
G.J. Shah1,2, A. Saucedo3, and R.M. van Dam3
1Sofie Biosciences, USA and 2University of California, Los Angeles, USA
REACTION CONTROL BY STIRRING-INDUCED, DISCRETE, RECURSIVE FUSION AND DIVISION OF
FEMTOLITER COMPARTMENTS IN EMULSION
T. Ichii¹, G. Tanahashi², H. Suzuki³, and T. Yomo¹
¹Japan Science and Technology Agency (JST), JAPAN, ²Osaka University, JAPAN, and ³Chuo University, JAPAN

GUIDING OF LIQUIDS VIA PATTERNED SURFACE COATINGS TO FACILITATE SOLID-PHASE
EXTRACTION IN TWO-PHASE FLOW
M. Rendl, T. Brandstetter, J. Rühe
University of Freiburg - IMTEK, GERMANY

CELL-FREE PROTEIN SYNTHESIS IN VERTICALLY-ORIENTED MICROREACTOR ARRAY DEVICES
K. Jackson and Z.H. Fan
University of Florida, USA

HIGH THROUGHPUT SYNTHESIS OF OLIGONUCLEOTIDE UTILIZING INKJET PRINTER AND MICRO-
REACTOR ARRAY FILLED WITH ROBUST OPAL
H. Li¹, Y. Huang¹, H.Q. Yu¹, Y. Ma¹, C.Y. Tang², Z.W. Wei¹, Z.C. Liang¹, W. Wang¹, Z.J. Yang¹, and Z.H. Li¹
¹Peking University, CHINA, ²Multimedia University, MALAYSIA, and
³National Center for Nanoscience and Technology, CHINA

CENTRIFUGE-BASED STEPWISE CHEMICAL LOADING DISC FOR HIGH-THROUGHPUT GOLD
NANOPARTICLE SYNTHESIS
Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA

MICROFLUIDIC PREPARATION OF BIOCATALYTIC PROTEIN MICROSPHERES UTILISING ON-CHIP
CROSS-LINKING METHOD
M.B. Mbanjwa¹, H. Chen², and K. Land¹
¹Council for Scientific and Industrial Research (CSIR), SOUTH AFRICA and
²University of the Witwatersrand, SOUTH AFRICA

PAPER-BASED MICROFLUIDIC FUEL CELLS
J.P. Esquivel¹, F.J. del Campo¹, J.L. Gómez de la Fuente³, S. Rojas³, and N. Sabaté¹
¹IMB-CNMT (CSIC), SPAIN and ²University of Washington, USA, ³ICP (CSIC), SPAIN

A LOW-TEMPERATURE POM MICRO METHANOL REFORMER WITH HIGH FUEL CONVERSION RATE
AND HYDROGEN PRODUCTION YIELD
H.-S. Wang, Y.-C. Su, Y.-J. Huang, and F.-G. Tseng
National Tsing Hua University, TAIWAN
STREAMING CURRENT OF A ROTARY ATOMIZER FOR ENERGY HARVESTING
T. Nguyen, H. de Boer, T. Tran, A. van den Berg, and J.C.T. Eijkel
MESA+, University of Twente, THE NETHERLANDS

MicroTAS for Other Applications

Synthetic Biology

SOFTWARE AUTOMATED GENOMIC ENGINEERING (SAGE) ENABLED BY ELECTROWETTING-ON-DIELECTRIC DIGITAL MICROFLUIDICS
M. Sandahl¹, S. Punnamaraju¹, A. Madison², J. Harrington¹, M. Royal², R. Fair², A. Eckhardt¹,
A. Sudarsan¹, and M. Pollack¹
¹Advanced Liquid Logic, Inc., USA and ²Duke University, USA

Bioinspired, Biomimetic & Biohybrid Devices

CIRCULAR HYDROGEL PATTERN FOR CELL ALIGNMENT UNDER UNIFORM STRAIN STIMULATION
H.Y. Hsieh¹,²,³, T.W. Huang², G. Camci-Unal³,⁴, F.G. Tseng²,⁵, S.K. Fan¹, and A. Khademhossein³,⁴,⁶
¹National Taiwan University, TAIWAN, ²National Tsing Hua University, TAIWAN, ³Brigham and Women’s Hospital, Harvard Medical School, USA, ⁴Massachusetts Institute of Technology, USA, ⁵Academia Sinica, TAIWAN, and ⁶Harvard University, USA

STUDY OF MOLECULAR TRANSPORT THROUGH SPECIFIC LIQUID IN BIO-MIMETIC EXTENDED NANOSPACES
University of Tokyo, JAPAN

Bioprocess Technology

DROPLET BASED DIRECTED EVOLUTION OF YEAST CELL FACTORIES DOUBLES PRODUCTION OF INDUSTRIAL ENZYMES
S.L. Sjostrom¹, Y. Bai¹, M. Huang², J. Nielsen¹,²,³, H.N. Joensson¹, and H. Andersson Svahn¹
¹Royal Institute of Technology (KTH), SWEDEN, ²Chalmers University of Technology, SWEDEN, and ³Technical University of Denmark, DENMARK

SIMPLE MICROFLUIDICS FOR COMPLEX ORGANISMS: A MICROFLUIDIC CHIP SYSTEM FOR GROWTH AND MORPHOGENESIS STUDIES OF FILAMENTOUS FUNGI
A. Grünberger, K. Schmitz, C. Probst, W. Wiechert, S. Noack, and D. Kohlheyer
Forschungszentrum Jülich GmbH, GERMANY

Food & Nutrition

CENTRIFUGAL LABTUBE FOR FULLY AUTOMATED DNA EXTRACTION & LAMP AMPLIFICATION BASED ON AN INTEGRATED, LOW-COST HEATING SYSTEM
M.M. Hoehl¹, M. WeiBert², N. Paust³,⁴, R. Zengerle³,⁴, A.H. Slocum¹, and J. Steigert²
¹Massachusetts Institute of Technology, USA, ²Robert Bosch GmbH, GERMANY, ³Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY, and ⁴University of Freiburg - IMTEK, GERMANY

16:00 - 16:30  Break and Exhibit Inspection
16:30 - 17:15  Plenary Presentation V
BIO-INSPIRED, SMART, MULTISCALE INTERFACIAL MATERIALS WITH SUPER-WETTABILITY
Lei Jiang
Chinese Academy of Sciences, CHINA
Session 2A3 - Electrochemical Detection and Imaging

17:30 - 17:50  
**DENSIFIED ELECTROCHEMICAL SENSOR BASED ON VERTICALLY SEPARATED ELECTRODE ARRAY FOR ELECTROCHEMICAL IMAGING**  
K. Ino, Y. Kanno, K. Komaki, H. Shiku, and T. Matsue  
*Tohoku University, JAPAN*

17:50 - 18:10  
**PAPER-BASED MICROFLUIDIC ELECTROCHEMICAL IMMUNODEVICES INTEGRATED WITH NANOBIOPROBES ON GRAPHENE FILM FOR ULTRASENSITIVE DETECTION OF CANCER BIOMARKERS**  
Y. Wu¹, P. Xue¹, K.M. Hui², and Y. Kang¹  
¹*Nanyang Technological University, SINGAPORE and ²National Cancer Center, SINGAPORE*

18:10 - 18:30  
**NON-FARADAIC ELECTROCHEMICAL DETECTION OF PATHOGENIC DNA AMPLIFIED BY TARGET DRIVEN SELF ASSEMBLY ON A CMOS PLATFORM**  
*Cornell University, USA*

Session 2B3 - Immunoassays

17:30 - 17:50  
**SELF-ASSEMBLED MELAMINE MICROLENS ARRAYS FOR IMMUNOFUORESCENCE ENHANCEMENT**  
H. Yang, H.C. Tekin, A. Sayah, and M.A.M. Gijs  
*École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND*

17:50 - 18:10  
**SEQUENCE-SELECTIVE DNA METHYLATION ANALYSIS INDUCED BY BULGE SPECIFIC IMMUNO-RECOGNITION ON A SURFACE PLASMON RESONANCE FLUIDIC CHIP**  
R. Kurita, H. Yanagisawa, K. Yoshioka, and O. Niwa  
*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*

18:10 - 18:30  
**ENHANCEMENT OF IMMUNOREACTION ON MICROARRAY-INTEGRATED OPTOELECTROFLUIDIC ASSAY SYSTEM**  
D. Han, H.J. Gi, and J.-K. Park  
*Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA*
Wednesday 30 October

08:30 - 08:45  Announcements

08:45 - 09:30  Plenary Presentation VI
MICROFLUIDIC FABRICATION OF CELL AND TISSUE ARCHITECTURE
Shoji Takeuchi
University of Tokyo, Kanagawa Academy of Science and Technology, and
Japan Science and Technology Agency (JST), JAPAN

Session 3A1 - Point-of-Care Nucleic Acid Analysis

09:45 - 10:05
LOW-COST BACTERIAL DETECTION SYSTEM FOR FOOD SAFETY BASED ON AUTOMATED DNA EXTRACTION, AMPLIFICATION AND READOUT
M. Hoehl1,2, E. Schulte Bocholt2, N. Karippai2, R. Zengerle3,4, J. Steigert2, and A. Slocum1
1Massachusetts Institute of Technology, USA, 2Robert Bosch GmbH, GERMANY, 3Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY, and 4University of Freiburg - IMTEK, GERMANY

10:05 - 10:25
DEVELOPMENT OF THE POCT-ORIENTED PCR DEVICE DRIVEN BY CENTRIFUGATION ASSISTED THERMAL CONVECTION
M. Saito, Y. Kiriyama, K. Yamanaka, and E. Tamiya
Osaka University, JAPAN

10:25 - 10:45
SAMPLE-PRETREATMENT OF INFLUENZA A VIRUS BASED ON THE MICROBEAD INCORPORATED CENTRIFUGAL MICRODEVICE
Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA

Session 3B1 - Protein Processing and Analysis 1

09:45 - 10:05
PROBING PHYSICAL PROPERTIES OF DNA-PROTEIN COMPLEXES USING NANOFLUIDIC CHANNELS
K. Frykholm1, M. Alizadehheidari1, L. Fornander1, J. Fritzsche1, J. Wigenius1, P. Beuning2, M. Modesti3, F. Persson1, and F. Westerlund1
1Chalmers University of Technology, SWEDEN, 2Northeastern University, USA, 3Universite Aix-Marseille, FRANCE, and 4Uppsala University, SWEDEN

10:05 - 10:25
HIGH THROUGHPUT FORMATION OF SUB-MILLION LIPID MEMBRANE ARRAYS FOR MEASURING THE MEMBRANE PROTEIN ACTIVITIES
R. Watanabe1,2, D. Fujita1, K.V. Tabata1,2, L. Yamauchi1, N. Soga1, S.H. Kim1, H. Suga1, and H. Noji1,2
1University of Tokyo, JAPAN, 2Japan Science and Technology Agency (JST), JAPAN, and 2Pohang University of Science and Technology, SOUTH KOREA

10:25 - 10:45
PROTEIN CRYSTALLIZATION INDUCED BY ELECTRICALLY DRIVEN BUBBLE KNIFE
H. Kuriki1, S. Takasawa1, S. Sakuma2, K. Shinmura3, G. Kurisu3, F. Arai1, and Y. Yamanishi2
1Nagoya University, JAPAN, 2Shibaura Institute of Technology, JAPAN, and 3Osaka University, JAPAN

Session 3C1 - Blood Processing

09:45 - 10:05
ACOUSTOPHORESIS SEPARATION OF BACTERIA FROM BLOOD CELLS FOR RAPID SEPSIS DIAGNOSTICS
P.D. Ohlsson, K. Petersson, P. Augustsson, and T. Laurell
Lund University, SWEDEN
10:05 - 10:25
**ONE-STEP DIGITAL PLASMA SEPARATION FOR MOLECULAR DIAGNOSTICS**
E.-C. Yeh, and L.P. Lee
*University of California, Berkeley, USA*

10:25 - 10:45
**NO-DIALYSATE MICRO HEMODIALYSIS SYSTEM**
H. Ito¹, G.S. Prihandana¹, I. Sanada¹, M. Hayashi¹, Y. Kanno², and N. Miki¹
¹Keio University, JAPAN and ²Tokyo Medical University, JAPAN

10:45 - 11:15  **Break and Exhibit Inspection**

**11:15 - 11:35**
**CYTOPLASMIC TRANSFER BETWEEN ADHERED CELLS BY CELL FUSION THROUGH MICROSLIT**
K.-I. Wada, E. Kondo, K. Hosokawa, Y. Ito, and M. Maeda
*Institute of Physical and Chemical Research (RIKEN), JAPAN*

11:35 - 11:55
**MICROFLUIDIC ELECTRO-SONOPORATION BY SIMULTANEOUS APPLICATION OF ELECTRIC FIELD AND ACOUSTIC FIELD**
H. Wang¹,², W. Longsine-Parker¹, C. Koo¹, J. Kim³, B.J. Kim³, A. Jayaraman¹, and A. Han¹
¹Texas A&M University, USA, ²Dankook University Graduate School, SOUTH KOREA, and ³University of Tokyo, JAPAN

11:55 - 12:15
**ELECTROACTIVE MICROWELL ARRAY FOR QUANTITATIVE MEASUREMENT OF INTRACELLULAR ATP AT THE SINGLE-CELL LEVEL**
S.H. Kim¹,², T. Fujii¹,², and D. Fourmy³
¹University of Tokyo, JAPAN, ²Japan Science and Technology Agency (JST), JAPAN, and ³CNRS, FRANCE

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**Session 3B2 - Protein Processing and Analysis 2**

11:15 - 11:35
**SINGLE CELL WESTERN BLOTTING**
A.J. Hughes, D.P. Spelke, Z. Xu, D.V. Schaffer, and A.E. Herr
*University of California, Berkeley, USA*

11:35 - 11:55
**HIGH-THROUGHPUT MICRODROPLET-BASED ANALYSIS OF POST-TRANSLATIONAL PROTEIN MODIFICATIONS USING MASS SPECTROMETRY**
S.K. Küster, M. Pabst, R. Zenobi, and P.S. Dittrich
*ETH Zürich, SWITZERLAND*

11:55 - 12:15
**DETERMINISTIC PROTEIN EXTRACTION FROM DROPLETS USING INTERFACIAL DRAG AND TENSIOPHORESIS**
G.K. Kurup and A.S. Basu
*Wayne State University, USA*

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**Session 3C2 - Point-of-Care Bacterial Detection**

11:15 - 11:35
**SMARTPHONE DETECTION OF *ESCHERICHIA COLI* FROM WASTEWATER UTILIZING PAPER MICROFLUIDICS**
T.S. Park, D.K. Harshman, C.F. Fronczek, and J.-Y. Yoon
*University of Arizona, USA*
11:35 - 11:55
**A SIMPLE INTEGRATED DIAGNOSTIC PLATFORM FOR DNA TESTING OF CHLAMYDIA TRACHOMATIS INFECTION**
D.J. Shin, L. Chen, and T.H. Wang
*Johns Hopkins University, USA*

11:55 - 12:15
**MICROFLUIDIC PLATFORM FOR RAPID ANTIBIOTIC SUSCEPTIBILITY TESTING OF POLYMICROBIAL COMMUNITIES**
R. Mohan, C. Sanpitakseree, E. Sevgen, A.V. Desai, C.M. Schroeder, and P.J.A. Kenis
*University of Illinois, Urbana-Champaign, USA*

12:15 - 13:15  
**Lunch**

13:15 - 14:00  
**Plenary Presentation VII**
**AUTOMATED DROPLET MICROFLUIDICS**
S. Jakiela¹, T. Kaminski¹, L. Derzsi¹, P. Korczyk¹, J. Guzowski¹, K. Churski¹, P. Debski¹, M. Pyzalska¹, A. Rakszewska¹, M. Rażew¹, S. Makulsk¹, O. Cybulski¹, M. Costantini¹², W. Postek¹, M. Czekalska¹, P. Jankowski¹, Piotr Garstecki¹
¹Polish Academy of Sciences, POLAND and ²Sapienza University of Rome, ITALY

14:00 - 16:00  
**Poster Session 3**

**Fundamentals in Microfluidics and Nanofluidics**

**Electrokinetic Phenomena**

**W.001a**
**DIELECTROPHORETIC SORTING OF MICROPARTICLES AND LYMPHOCYTES USING RAIL-TYPE ELECTRODES**
K. Tatsumi, H. Shintani, Y. Katsumoto, and K. Nakabe
¹Kyoto University, JAPAN and ²Sony Corporation, JAPAN

**W.002a**
**SELF-ROTATION AND ELECTROKINETIC PROPERTIES OF CELLS IN A NON-ROTATIONAL AC ELECTRIC FIELD**
C. Benoit¹, T. Honegger², and D. Peyrade¹
¹LTM-CNRS, FRANCE and ²Massachusetts Institute of Technology, USA

**Droplets & Plugs, Multiphase Systems**

**W.003a**
**A HIGHLY PARALLEL MICROFLUIDIC DROPLET METHOD FOR SINGLE ENZYME MOLECULE DETECTION**
Z. Guan, Z. Zhu and C.J. Yang
*Xiamen University, CHINA*

**W.004a**
**ACTIVE SEQUENTIAL MERGING OF TWO REAGENTS ISOLATED IN MICRO DROPLETS IN MULTIPLE RATIOS**
*Waseda University, JAPAN*

**W.005a**
**CONTINUOUS MICROFLUIDIC ASSEMBLY OF ANISOTROPIC MICROPARTICLE DIMERS**
A.X. Lu, K. Jiang, D.L. Devoe, and S.R. Raghavan
*University of Maryland, College Park, USA*
W.006a
HIGH THROUGHPUT SINGLE CANCER CELL ENCAPSULATION AND SELF SORTING FOR PROTEASE ASSAY BY USING JETTING MICROFLUIDICS
T. Jing1,2, R. Ramji1, M.E. Warkiani2, C.T. Lim1,2, J. Han2,3, and C.-H. Chen1,4
1National University of Singapore, SINGAPORE, 2Singapore-MIT Alliance for Research and Technology (SMART) Centre, SINGAPORE, 3Massachusetts Institute of Technology, USA, and 4Singapore Institute for Neurotechnology (SiNAPSE), SINGAPORE

W.007a
NON-INVASIVE CHARACTERIZATION OF DISSOLVED OXYGEN DYNAMICS IN WATER-IN-OIL DROPLET MICROFLUIDICS - TOWARDS 3D MICRO TUMOR SPHEROIDS FOR HIGH THROUGHPUT CANCER DRUG SCREENING
J.B. Erhardt1,2, V. Nock1, J. Kieninger2, and G.A. Urban1
1University of Canterbury, NEW ZEALAND and 2University of Freiburg, GERMANY

W.008a
PRECISE NANOFLITER DROPLET GENERATION AND VOLUME CONTROL IN ELECTROWETTING MICROCHANNELS
Y. Liu, A. Banerjee, and I. Papautsky
University of Cincinnati, USA

W.009a
SIZE BASED DROPLET SORTING WITH WIDE TUNING RANGE USING TENSIOPHORESIS
G.K. Kurup, and A.S. Basu
Wayne State University, USA

Optofluidics

W.010a
A NOVEL PARALLEL NANOMIXER FOR HIGH-THROUGHPUT SINGLE-MOLECULE FLUORESCENCE DETECTION
K. Mathwig1, S. Schlautmann1, S.G. Lemay1, and J. Hohlbein2
1MESA+, University of Twente, THE NETHERLANDS and 2Wageningen University, THE NETHERLANDS

W.011a
LABEL-FREE OPTOFLOWID BIOMOLECULAR SENSING USING A PHOTONIC CRYSTAL NANOTWEEZER: THE WIGGLE ASSAY
P. Kang1, Y.-F. Chen2, and D. Erickson1
1Cornell University, USA and 2National Cheng Kung University, TAIWAN

W.012a
NEGATIVE PHOTOTAXIS BEHAVIOUR OF ORGANIC DROPLETS IN CHANNELS
L. Florea1, K. Wagner2, P. Wagner2, D.L. Officer2, G.W. Wallace2, F. Benito-Lopez1,2, and D. Diamond1
1Dublin City University, IRELAND, 2University of Wollongong, AUSTRALIA, and 1CIC microGUNE, SPAIN

Magnetofluidics (Magnetic Particles & Related Phenomena)

W.013a
MAGNETIC FLUIDIZED BED IN MICROFLUIDICS: HYDRODYNAMIC CHARACTERIZATION AND VALIDATION TO IMMUNOCAPTURE
S. Tabnaoui1, I. Pereiro1, M. Fermigier1, S. Descroix1, J.L. Violy1, and L. Malaquin1
1Institut Curie, FRANCE and 2PMMH-ESPCI, FRANCE

Acoustic Phenomena (BULK & Surface Based)

W.014a
ACOUSTIC CONTROL OF LIQUIDS IN MICROCHANNELS
S. Deshmukh1,2, P. Augustsson1, Z. Brzozka2, and T. Laurell1,3
1Lund University, SWEDEN, 2Warsaw University of Technology, POLAND, and 3Dongguk University, SOUTH KOREA
W.015a
MAGNITUDE AND VARIANCE OF ACOUSTIC ENERGY DENSITY IN MICROCHANNEL ACOUSTOPHORESIS: COMPARISON BETWEEN SINGLE-FREQUENCY AND FREQUENCY-MODULATED ACTUATION
I. Iranmanesh1, R. Barnkob2, H. Bruus2, and M. Wiklund1
1Royal Institute of Technology (KTH), SWEDEN and 2Danmarks Tekniske Universitet (DTU), DENMARK

Nanofluidic Phenomena (Nanochannels, -Tubes & -Pores)

W.016a
LABEL-FREE NANOFLUIDIC PRECONCENTRATION WITH MULTI-OPERATIONAL MODES BY LOOP CURRENTS MONITORING FOR BIOLOGICAL APPLICATION
P.-S. Chung, Y.-L. Liu, K.-P. Liao, Y.-J. Fan, K.-B. Sung, H.-J. Sheen, and W.-C. Tian
National Taiwan University, TAIWAN

W.017a
RAPID MONITORING LOW ABUNDANCE PROSTATE SPECIFIC ANTIGEN BY PROTEIN NANOCONSTRUCTION MOLECULAR DAM
K.-T. Liao
1Academia Sinica, TAIWAN, 2University of Virginia, 3National Institute of Standards and Technology (NIST), USA, and 4University of Maryland, USA

Micro- and Nanoengineering

Micro- & Nanofabrication/ -Patterning/ -Integration

W.018b
A FLEXIBLE METHOD FOR RAPID-PROTOTYPING OF PDMS MICROFLUIDIC CHIPS USING DIRECT-WRITING FOR GENERATION OF POLYMER-MASTER-STRUCTURES
L. Gutzweiler1, F. Stumpf2, L. Riegger1, P. Koltay1, R. Zengerle1, and L. Tanguy2
1University of Freiburg - IMTEK, GERMANY and 2Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY

W.019b
A MANUFACTURABLE PLATFORM FOR IN VITRO ELECTROPHYSIOLOGICAL STUDIES UNDER MECHANICAL STIMULATION
S. Khoshfetrat Pakazad1, A. Savoy1, and R. Dekker1,2
1Delft University of Technology, THE NETHERLANDS and 2Philips Research Eindhoven, THE NETHERLANDS

W.020b
DIRECT CHEMICAL-COMPUTER INTERFACE FOR LIVING CELL ANALYSIS
T. Hoshino, A. Wagatsuma, and K. Mabuchi
University of Tokyo, JAPAN

W.021b
FABRICATION OF GOLD-NANOPARTICLE ARRAYS USING PHOTOLITHOGRAPHY AND THERMAL DEWETTING
L. de Vreede, K. Göeken, R. Gill, A. van den Berg, and J. Eijkel
University of Twente, THE NETHERLANDS

W.022b
NOVEL NANOPLASMONIC-ENHANCED D2PA MICROFLUIDIC IMMUNOASSAY WITH 2.8 NG/ML (66 PM) SENSITIVITY IN 100 NL SAMPLE VOLUME AND 4 MINUTES TOTAL ASSAY TIME
Princeton University, USA

W.023b
MULTIDIRECTIONAL TILTED UV LITHOGRAPHY: A KEY FABRICATION METHOD OF POLYMERIC MICROFLUIDIC DEVICE
S.J. Lee1, B.I. Kim1, K.G. Lee2, T.J. Lee1, and B.G. Choi2
1National Nanofab Center, SOUTH KOREA and 2University of Michigan, USA
W.024b
PARYLENE C-MEDIATED-PDMS: AN APPROACH FOR FUNCTIONALIZATION OF PDMS MICROFLUIDIC DEVICES
L. Zhang1, H. Sun1, Y. Wu1, W. Wang1, D. Li2, H.A. Zhang1, W. Wu1 and Z. Li1
1Peking University, CHINA and 2Tianjin University, CHINA

W.025b
SCALEABLE BLM ARRAYS FOR PARALLEL ION CHANNEL RECORDING
S.C. Saha1, F. Thei2, M.R.R. de Planque1, and H. Morgan1
1University of Southampton, UK and 2University of Bologna, ITALY

W.026b
MICRO-SCALE DROPLET CONTACT METHOD BY MECHANICAL MOTION: REPRODUCIBLE AND ROBUST LIPID BILAYER FORMATION
L.N.S. Zaleha1,2, R. Kawano1, H. Yasuga1,2, K. Kamiya1, T. Osaki1,3, N. Miki1,2, and S. Takeuchi1,3
1Kanagawa Academy of Science and Technology, JAPAN, 2Keio University, JAPAN, and 3University of Tokyo, JAPAN

Bonding, Sealing & Interfacing Technologies

W.027b
MICROFLUIDIC TRANSWELL INSERTS FOR GENERATION OF TISSUE CULTURE-FRIENDLY GRADIENTS IN WELL PLATES
C.G. Sip and A. Folch
University of Washington, USA

Novel/Smart/Responsive Materials

W.028b
ENGINEERING SUPERLYOPHOBIC SURFACES ON CURABLE MATERIALS BASED ON FACILE AND INEXPENSIVE MICROFABRICATION
L. Yuan1, W. Zhang1, Z. Tang1, T. Wu2, L. Zhang3, and L. Luan4
1Sun Yat-sen University, CHINA, 2Chinese Academy of Sciences, CHINA, 3Tsinghua University, CHINA, and 4Kuang-Chi Institute of Advanced Technology, CHINA

W.029b
MICROFLUIDIC FORMATION OF STIMULUS RESPONSIVE SOFT MATERIALS
H. Chen and A. Guenther
University of Toronto, CANADA

W.030b
SIMPLE AND SMART MICROFLUIDIC GEL ACTUATOR
K. Ito1, S. Sakuma2, Y. Yokoyama3, and F. Arai1
1Nagoya University, JAPAN, 2Osaka University, JAPAN, and 3Toyama Industrial Technology Center, JAPAN

Surface Modification

W.031b
MASKED PLASMA OXIDATION METHOD AS A SIMPLE MICROPATTERNING OF EXTRACELLULAR MATRIX IN A CLOSED MICROCHAMBER ARRAY
K. Hattori1, R. Yoshimitsu2, S. Sugiuira3, A. Maruyama2, K. Ohnuma2, and T. Kanamori3
1National Institute of Advanced Industrial Science and Technology (AIST), JAPAN and 2Nagaoka University of Technology, JAPAN

W.032b
POLYHEMA SOFT LITHOGRAPHY FOR SELECTIVE CELL SEEDING, MIGRATION BLOCKING, AND HIGH-THROUGHPUT SUSPENSION CELL CULTURE
P.N. Ingram, Y.-C. Chen, and E. Yoon
University of Michigan, USA
Molecular Systems & Nanochemistry

W.033b
MICROTUBULE GLIDING AT THE BOUNDARY OF KINESIN AND DYNEIN PATTERNED SURFACE
J. Ikuta1, N.K. Kamisetty2, H. Shintaku1, H. Kotera1, and R. Yokokawa1,2
1Kyoto University, JAPAN and 2Japan Science and Technology Agency (JST), JAPAN

Nanobiotechnology

W.034b
A CO-CULTURE HUMAN LUNG-ON-A-CHIP MODEL TO ASCERTAIN THE EFFECTS OF NANOPARTICLES
S. Bhattacharjee, Z. Hao, H.L. de Boer, A. van den Berg, and S. Le Gac
MESA+, University of Twente, THE NETHERLANDS

Nanoassembly

W.037b
NANOWIRE FORMATION USING SPECIFIC METALLIZATION OF DOUBLE-STRANDED DNA
T. Himuro, R. Araki, H. Ikedo, S. Sato, S. Takenaka, and T. Yasuda
Kyushu Institute of Technology, JAPAN

Sensors & Actuators, Detection Technologies

Micropumps, -Valves, -Dispensers

W.038c
A MICRO CONTROL VALVE WITH INTEGRATED CAPACITIVE SENSING FOR AMBULANT BLOOD PRESSURE WAVEFORM MONITORING
M.S. Groen1, R.A. Brookhuis1, M.J. van Houwelingen2, D.M. Brouwer1,3, J.C. Lotters1,4, and R.J. Wiegerink1

W.039c
ON-CHIP PUMP SYSTEM FOR HIGH-PRESSURE MICROFLUIDIC APPLICATIONS
S. Ogden, S. Knaust, A.P. Dahlin, K. Hjort, and R. Bodén
Uppsala University, SWEDEN

W.040c
TOTALLY GLASS-BASED MICROCHIPS WITH VALVES AND PUMPS USING FLEXIBILITY OF ULTRA THIN GLASS
Y. Tanaka
Institute of Physical and Chemical Research (RIKEN), JAPAN

Physical Sensors

W.041c
A NEW MICROWAVE BIO-MICROSENSOR WITH MINUTE DROPLET OF LIPOSOME SUSPENSION AND TARGET BIOMOLECULES USING S-PARAMETER METHOD FOR DIELECTRIC DISPERSION ANALYSIS
K. Takada, K. Yamashita, and M. Noda
Kyoto Institute of Technology, JAPAN
W.042c
NOVEL THERMAL MICRO SENSOR METHOD FOR ONLINE MONITORING OF IN-VITRO BIOFILM FORMATION
O. Behrmann, D.F. Reyes Romero, G. Dame, and G.A. Urban
University of Freiburg - IMTEK, GERMANY

Biosensors

W.043c
HIGH-DENSITY 3D NANOSTRUCTURED PILLAR ARRAYS OF SURFACE ENHANCED RAMAN SCATTERING (SERS) BIOSENSOR FOR SINGLE BACTERIA DETECTION BY LOCAL ELECTROKINETIC TRAPPING
J.-K. Wu¹, C.-W. Lee¹, T.-F. Kuo¹, H.-Y. Chang¹, and F.-G. Tseng¹,²
¹National Tsing Hua University, TAIWAN and ²Academia Sinica, TAIWAN

W.044c
A NEW CONCEPT FOR A HIGHLY INTEGRATED AND FLEXIBLE BIOSENSOR SYSTEM USING AN ARRAY OF SURFACE ACOUSTIC WAVE (SAW) SENSORS
F. Gruhl, R. Tjahyawati, J. Krattenmacher, and M. Rapp, Karlsruhe Institute of Technology, GERMANY

W.045c
A NOVEL OPTICAL BIOSENSOR WITH INTERNAL REFERENCING
R. Gupta, and N.J. Goddard
University of Manchester, UK

W.046c
AN OPTICAL BIOSENSING PLATFORM USING COMMON ELECTRONICS COMPONENTS ONLY
Y.D. Han, Y.H. Jang, and H.C. Yoon
Ajou University, SOUTH KOREA

W.047c
BIOFUNCTIONALIZED LAB-ON-A-CHIP WITH DUAL READOUT
B. Ibarlucea¹, X. Munoz-Berbel¹, P. Ortiz¹, S. Büttgenbach², C. Fernández-Sánchez¹, and A. Llobera¹
¹Institut de Microelectronica de Barcelona, IMB-CNM (CSIC), SPAIN and ²Technische Universität Braunschweig, GERMANY

W.048c
CHARACTERIZATION OF APTAMER-BASED BIOSENSOR ON A CHIP WITH SINGLE EXPERIMENTS
M. Hamon, J. Dai, J. Wower, and J.W. Hong
Auburn University, USA

W.049c
DIELECTRIC ANALYSIS OF CHANGES IN ELECTRIC PROPERTIES OF DOXORUBICIN RESISTANT K562 LEUKEMIC CELLS THROUGH ELECTROROTATION WITH 3-D ELECTRODES
G. Bahrieh, M. Erdem, E. Özgür, U. Gündüz, and H. Külah
Middle East Technical University (METU), TURKEY

W.050c
HYDROGEL-BASED IMAGING SENSOR FOR THE ASSAY OF EXERCISE-DEPENDENT METABOLIC REGULATION IN SKELETAL MUSCLE CELLS
K. Nagamine, K. Okamoto, H. Kaji, M. Kanzaki, and M. Nishizawa
Tohoku University, JAPAN

W.051c
LABEL-FREE CHARACTERIZATION OF AMYLOID GROWTH BY SUSPENDED MICROCHANNEL RESONATORS
Y. Wang, M.M. Modena, and T.P. Burg
Max Planck Institute for Biophysical Chemistry, GERMANY
W.052c
MICROFLUIDIC INTEGRATION OF PLASMONIC APPLICATIONS FOR HIGHLY SENSITIVE BIOANALYSIS
C.Y. Xiao, Z. Cao, Z.F. Huang, Z. Xu, J.X. Fu, and L. Yobas
1Hong Kong Baptist University, HONG KONG, 2Hong Kong University of Science and Technology, HONG KONG, and 3Beijing Jiaotong University, HONG KONG

W.053c
MULTI-TARGET TOXIC DETECTIONS BASED ON PIEZORESISTIVE MICROCANTILEVERS
R. Zhao, J. Zhang, J. Yang, Y. Wen, and X. Yu
Peking University, CHINA

W.054c
NOISE-IMMUNE SILICON NANOWIRE/CMOS HYBRID BIOSENSOR USING TOP-DOWN APPROACH
1Kookmin University, SOUTH KOREA and 2Seoul National University, SOUTH KOREA

W.055c
RAPID AND AUTOMATED FORMATION OF SUSPENDED LIPID BILAYER ARRAYS FOR PARALLEL ION CHANNEL AND PROTEIN NANOPORE RECORDING
G. Baaken, E. Zaitseva, S. Petersen, J.M. del Rio Martinez, M. Hoffmann, and J.C. Behrends
1University of Freiburg, GERMANY and 2Ionera Technologies GmbH i.G., GERMANY

W.056c
SINGLE NUCLEOTIDE POLYMORPHISM (SNP) DETECTION ON A MAGNETORESISTIVE SENSOR
G. Rizzi, F.W. Østerberg, M. Dufva, and M.F. Hansen
Danmarks Tekniske Universitet (DTU), DENMARK

Chemical & Electrochemical Sensors

W.057c
A MICROMACHINED MICROPRECONCENTRATOR DESIGN BASED ON QUANTITATIVE SIMULATION STUDY FOR VOLATILE ORGANIC COMPOUNDS GAS SENSING
N. Kakita, H. Miyashita, S. Kishida, J.-O. Lee, and S.-S. Lee
1Tottori University, JAPAN and 2Korea Research Institute of Chemical Technology, SOUTH KOREA

W.058c
A VOC SENSOR BASED ON MICROMECHANICAL CANTILEVER FUNCTIONALIZED WITH ZNO NANORODS
1Koc University, Rumelifeneri Youl, TURKEY, 2Gebze Institute of Technology, TURKEY, and 3Mus Alparslan University, TURKEY

W.059c
DIFFUSION COEFFICIENT MEASUREMENT BASED ON DIFFUSION-INDUCED FOCUSING IN OPTOFLUIDIC WAVEGUIDE
H.T. Zhao, Y. Yang, L.K. Chin, and A.Q. Liu
Nanyang Technological University, SINGAPORE

W.060c
FOUR ELECTRODE 3D CONTACTLESS CONDUCTIVITY DETECTOR FOR MICROFLUIDIC APPLICATIONS
K. Maciejewska (Blaszczyk), K. Zukowski, M. Balcerzak, D. Kapica, J. Janiszewska, M. Chudy, Z. Brzozka, and A. Dybko
Warsaw University of Technology, POLAND

W.061c
MAGNETIC SENSOR PARTICLES: A NEW TOOL FOR THE DETERMINATION OF OXYGEN IN MICROFLUIDICS
B. Ungerböck, J. Ehgärtner, S. Fellinger, P. Sulzer, and T. Mayr
Graz University of Technology, AUSTRIA
Visualization & Imaging Technologies

W.062c
NANOFLUIDIC CRYSTAL BASED LEAD SENSOR WITH DETECTION OF PICO-MOLAR
R. Zhang¹, J. Sang¹, J. Huang¹,², W. Wang¹,², M. Chu¹, Y. Wang¹, H. Li¹, H.A. Zhang¹,², W. Wu¹,², and Z. Li¹,²
¹Peking University, CHINA and ²National Key Laboratory of Science and Technology on Micro/Nano Fabrication, CHINA

W.063c
SINGLE-STEP CASPASE-3 INHIBITOR ASSAY BY USING COMBINABLE PDMS CAPILLARY (CPC) SENSOR ARRAY
T. Ishimoto, K. Jigawa, T.G. Henares, K. Sueyoshi, T. Endo, and H. Hisamoto
Osaka Prefecture University, JAPAN

W.064c
FUNCTIONALIZED PARTICLE IMAGE VELOCIMETRY FOR SIMULTANEOUS MEASUREMENTS IN MICRO/NANOCHANNEL FLOWS
Y. Kazoe, K. Yamamoto, K. Mawatari, and T. Kitamori
University of Tokyo, JAPAN

W.065c
MICRO/NANO XCT FOR COMPLEX MULTILAYER MICROFLUIDIC DEVICE METROLOGY
A. Iles¹,², D. Bernard³, and D. Sideris¹
¹Genetic Microdevices, UK, ²University of Hull, UK, and ³Nordson Dage Ltd, UK

W.066c
REAL-TIME IMAGE-BASED SORTING OF PICOLITER DROPLETS
E. Zang, M. Tovar, S. Brandes, M.T. Figge, and M. Roth
Hans-Knöll-Institute Jena, GERMANY

Optical Detection

W.067c
TRACE HEAVY METAL ANALYSIS USING WHISPERING GALLERY MODE SENSING
S. Panich, K.A. Wilson, and J.B. Edel
Imperial College London, UK

W.068c
COMBINATION OF MULTI LEDS LIGHT SOURCE AND LIGHT ABSORPTION CELL DESIGNED FOR COLORIMETRIC ANALYSIS OF BLOOD PLASMA
H. Matsui¹, F. Hagihara², T. Wada², and S. Konishi¹
¹Ritsumeikan University, JAPAN and ²Kyokko Electric Co., Ltd., JAPAN

W.069c
FABRICATION OF HYDROGEL-BASED TWO-DIMENSIONAL PHOTONIC CRYSTAL FOR OPTICAL SENSOR APPLICATION
T. Araki, T. Endo, K. Sueyoshi, and H. Hisamoto
Osaka Prefecture University, JAPAN

W.070c
LENSLESS CMOS-BASED IMAGING DEVICE FOR FLUORESCENT FEMTOLITER DROPLET ARRAY COUNTING
K. Sasagawa¹,², S.H. Kim¹,², K. Miyazawa¹, H. Takehara¹, T. Noda¹,³, T. Tokuda¹,³, R. Iino²,³, H. Noji²,³, and J. Ohta¹,³
¹Nara Institute of Science and Technology, JAPAN, ²University of Tokyo, JAPAN, and ³Japan Science and Technology Agency (JST), JAPAN

W.071c
NEAR-FIELD ILLUMINATION METHOD FOR THE SPECTROSCOPIC MEASUREMENT IN EXTENDED-NANO SPACE
R. Ohta, K. Mawatari, Y. Kazoe, Y. Pihosh, and T. Kitamori
University of Tokyo, JAPAN
RAPID BACTERIOPHAGE DETECTION VIA CO-CULTURE OF HOST CELL ESCHERICHIA COLI BY DROPLET OPTOFUIDIC SYSTEM
J.Q. Yu, W. Huang, L.K. Chin, L. Lei, Y.J. Zheng, W. Ser, and A.Q. Liu
Nanyang Technological University, SINGAPORE

CONTROLLING PARTICLE POSITION USING A NANOPORE TRAPPING METHOD
Osaka University, JAPAN

Novel Functionalities in Integrated Microfluidic Platforms
Platforms Based on Capillary Forces (Paper Based Microfluidics, Lateral Flow Tests)

ENHANCEMENT OF CAPILLARY CONDENSATION IN EXTENDED NANOSPACE FOR HIGH-PERFORMANCE MICRO HEAT PIPE DEVICE
K. Kasai¹, C. Wang¹,², H. Shimizu¹,², Y. Kazoe¹,², K. Mawatari¹,², and T. Kitamori¹,²
¹University of Tokyo, JAPAN and ²Japan Science and Technology Agency (JST), JAPAN

FABRICATION OF THREE-DIMENSIONAL MICROFLUIDIC CHANNELS IN A SINGLE LAYER OF CELLULOSE PAPER
X. Li and X.Y. Liu
McGill University, CANADA

PORTABLE AND SELF-POWERED PAPER-BASED ELECTROPHORETIC MICROFLUIDIC DEVICES
S.-S. Chen, Y.-C. Liao, and J.-T. Yang
National Taiwan University, TAIWAN

Microfluidic Large Scale Integration

A MICROFLUIDIC BASED FUNCTIONAL HIGH THROUGHPUT SCREEN TO DEVELOP ‘PATHOGENICITY LANDSCAPES’ OF INDWELLING DEVICE-RELATED PATHOGENS
W.M. Weaver, V. Milisavljevic, R. Damosieux, J.F. Miller, and D. Di Carlo
University of California, Los Angeles, USA

Digital Microfluidics on Surfaces

CORRELATION OF RAYLEIGH-SAW STREAMING AND THERMAL EFFECT FOR PREDICTION OF HEAT TRANSFER MECHANISM(S) WITHIN MICRODROPLET
D. Beyssen, T. Roux-Marchand, I. Perry, F. Sarry
Université de Lorraine, FRANCE

PLANARIZATION OF THE SURFACE OF ELECTROWETTING ON DIELECTRIC DEVICE FOR DROPLET SPEED IMPROVEMENT
C. Lee¹, H.C. Kim¹, and H. Chun²
¹Seoul National University, SOUTH KOREA and ²Korea University, SOUTH KOREA
Segmented Flow & Droplet Based Microfluidics in Channels

W.080d
A MULTIPLEXED MICROFLUIDIC DROPLET PLATFORM FOR MATRIX METALLOPROTEINASE SCREENING
T.D. Rane, H.C. Zec, and T.-H. Wang
Johns Hopkins University, USA

W.081d
A SIMPLE SYSTEM FOR IN-DROPLET INCUBATION AND QUANTIFICATION OF AGGLUTINATION ASSAYS
D. Castro, R. Kodzius, and I.G. Foulds
King Abdullah University of Science and Technology (KAUST), SAUDI ARABIA

W.082d
MANIPULATION OF MICROMETRIC DROPLETS
M. Leman, A.D. Griffiths, and P. Tabeling
Ecole Supérieure de Physique et de Chimie Industrielles (ESPCI), FRANCE

W.083d
ON-DEMAND PICOLITER-SCALE DROPLET GENERATION USING SURFACE ACOUSTIC WAVES
D.J. Collins, T. Alan, K. Helmerson, and A. Neild
Monash University, AUSTRALIA

Centrifugal Microfluidics

W.084d
AN INTEGRATED LAB-ON-A-CHIP SYSTEM WITH DNA EXTRACTION, PRE- AND MAIN PCR AMPLIFICATION FOR AUTOMATED DETECTION OF LOW CONCENTRATED PATHOGENS
G. Czilwik1, O. Strohmeier1, I. Schwarz2, N. Paust1, S. Zehnle1, F. von Stetten1,2, R. Zengele1,2,3, and D. Mark1
1Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY,
2University of Freiburg – IMTEK, GERMANY, and 3University of Freiburg – BIOSS, GERMANY

W.085d
EFFICIENT LEUKOCYTE ISOLATION BY DENSITY-GRADIENT CENTRIFUGATION VIA DUAL-CHAMBER PNEUMATIC SIPHONING
D.J. Kinahan, S.M. Kearney, and J. Ducree
Dublin City University, IRELAND

W.086d
INTEGRATION OF PINWHEEL ASSAY ON A CD-LIKE MICROCHIP FOR DNA QUANTITATION
Y. Ouyang, J. Li, J.P. Landers
University of Virginia, USA

Electrokinetic Microfluidics

W.087d
MODIFIED DVD-DRIVE AS AN INTEGRATED MICROFLUIDIC SYSTEM FOR Precipitate-based DETECTION OF LAMP ASSAY
M. Amasia, S. Zelenin, H. Ramachandraiah, P. Asalapuram, and A. Russom
Royal Institute of Technology (KTH), SWEDEN
Other & Novel Microfluidic Platforms

W.089d
3D PRINTED MICROFLUIDIC DEVICES FOR RECONFIGURABLE ANALYSIS SYSTEM
K. Aritome¹, W.P. Bula¹, K. Sakamoto², Y. Murakami³, and R. Miyake⁴
¹Hiroshima University, JAPAN, ²Kyushu Institute of Technology, JAPAN, ³Toyohashi University of Technology, JAPAN, and ⁴University of Tokyo, JAPAN

W.090d
COMPACT MICROFLUIDIC SYSTEM WITH SELF-ALIGNED MOUNTED HEADS FOR DIRECT USE ON INVERTED MICROSCOPES
J.F. Cors, R.D. Lovchik, E. Delamarche, and G.V. Kaigala
IBM Research GmbH, SWITZERLAND

W.091d
DISPOSABLE LABTUBE CARTRIDGES FOR AUTOMATED PROTEIN PURIFICATION IN STANDARD LAB CENTRIFUGES
A. Kloke¹, S. Niekrawietz¹, A.R. Fiebach¹, J. Bernhardt¹, R. Kneusel², K. Schemel², J. Ritzel², F. von Stetten¹, R. Zengerle¹, and N. Paust¹
¹Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY and ²Diarect AG, GERMANY

W.092d
INTERFACING PICOLITER DROPLET MICROFLUIDICS WITH ADDRESSABLE µL-COMPARTMENTS USING FACS
E. Weibull, Y. Bai, H.N. Joensson, H. Andersson-Svahn
Royal Institute of Technology (KTH), SWEDEN

W.093d
ON-CHIP ENUCLEATION OF OOCYTE USING UNTETHERD MICRO-ROBOT WITH GRIPPING MECHANISM
A. Ichikawa¹, S. Sakuma², T. Shoda³, F. Arai³, and S. Akagi⁴
¹Meijo University, JAPAN, ²Osaka University, JAPAN, ³Nagoya University, JAPAN, and ⁴NARO Institute of Livestock and Grassland Science, JAPAN

W.094d
PH SHIFT IN FROZEN ELECTROLYTE CAUSED BY IMBALANCE OF IONIC DISTRIBUTION BETWEEN ICE AND LIQUID PHASES
H. Watanabe and T. Okada
Tokyo Institute of Technology, JAPAN

W.095d
TOWARDS POINT-OF-CARE DIAGnostics: A MICROFLUIDIC SAMPLE PREPARATION CHIP FOR CONCENTRATION OF BACTERIA AND RNA EXTRACTION
H. Hubbe, S. Hakenberg, G. Dame, and G.A. Urban
University of Freiburg - IMTEK, GERMANY

Cells & Liposomes on Chip

Cell Capture, Counting, & Sorting

W.096e
A CELL-BASED SENSOR OF FLUID SHEAR STRESS FOR MICROFLUIDICS
S. Varma, H. Wei Hou, J. Han, and J. Voldman
Massachusetts Institute of Technology, USA

W.097e
BRIDGING THE GAP: TOWARDS MICROFLUIDIC SINGLE CELL ANALYSIS OF IN VIVO STIMULATED CELLS
F. Kurth, R.E. Wilson, A.J. Trüssel, D.J. Webster, R. Müller, and P.S. Dittrich
ETH Zürich, SWITZERLAND
CONTINUOUS FLOW CELL SEPARATION USING MICROFLUIDIC RATCHETS
C. Jin1, S.M. McFaul1, and H. Ma1,2
1University of British Columbia, CANADA and 2Vancouver General Hospital, CANADA

LABEL-FREE CELL SEPARATION BASED ON SIZE AND DEFORMABILITY USING MICROFLUIDIC RESETTABLE CELL TRAPS
W. Beattie1, X. Qin1, and H. Ma1,2
1University of British Columbia, CANADA and 2Vancouver General Hospital, CANADA

PIEZOELECTRIC INKJET-BASED SINGLE-CELLS PRINTING BY IMAGE PROCESSING FOR HIGH EFFICIENCY AND AUTOMATIC CELL PRINTING
R. The1, S. Yamaguchi2, A. Ueno2, Y. Akiyama1, and K. Morishima1
1Osaka University, JAPAN and 2Microjet Corporation, JAPAN

STANDING SURFACE ACOUSTIC WAVE BASED ON-CHIP, SHEATHLESS FLOW CYTOMETER
Y. Chen1, A.A. Nawaz1, Y. Zhao1, L. Wang2, and T.J. Huang1
1Pennsylvania State University, USA and 2Ascent Bio-Nano Technologies Inc., USA

CELL LAYOUTER: LABEL-FREE CELL ISOLATION AND ASPIRATION SYSTEM OF CIRCULATING TUMOR CELLS
T. Masuda1, Y. Sun1, M. Niimi1, A. Yusa2, H. Nakanishi3, and F. Arai1
1Nagoya University, JAPAN, 2Aichi Science and Technology Foundation, JAPAN, and 3Aichi Cancer Center Research Institute, JAPAN

NOVEL MICROFLUIDIC PLATFORMS FOR THE INTERROGATION OF PATIENT-DERIVED CTCs AND TUMOR-DERIVED MICROVESICLES
S.M. Santana, M.A. Antonyak, C. Fischbach-Teschl, R.A. Cerione, and B.J. Kirby
Cornell University, USA

ULTRA-HIGH PURITY CAPTURE OF CIRCULATING TUMOR CELLS AND GENE MUTATIONS DETECTION
Institut Curie, FRANCE

CELL ORDERING USING PINCH FLOW MICROCHANNEL FOR SINGLE CELL KINASE ASSAY
R. Ramji1, A.A.S. Bhagat2, C.T. Lim1, and C.-H. Chen1,3
1National University of Singapore, SINGAPORE, 2ClearBridge Biomedics Pte. Ltd., SINGAPORE, and 3Singapore Institute for Neurotechnology (SiNAPSE), SINGAPORE

DYNAMIC BEHAVIOR ANALYSIS OF SINGLE CELLS USING DROPLET MICROFLUIDICS
M.A. Khorshidi1, P.K. Periyannan Rajeswari1, C. Wahlby2, H.N. Joensson1, and H. Andersson Svahn1
1Royal Institute of Technology (KTH), SWEDEN and 2Uppsala University, SWEDEN

LAB-ON-A-CHIP SPECTROPHOTOMETRIC “FIELD OF QUALITY” ASSESSMENT OF DOG OOCYTES
P. Śniadek1, R. Waleczak1, J. Dziuban1, M. Woźna2, M. Rybska2, D. Bukowska2, and J. Jaskowski1
1Wroclaw University of Technology, POLAND and 2Poznan University of Life Sciences, POLAND
W.108e
MICROFLUIDIC SENSOR USING RESONANCE FREQUENCY MODULATION FOR CHARACTERIZATION OF SINGLE CELLS
N. Haandbæk1, O. With1, S.C. Bürger1, F. Heer2, and A. Hierlemann1
1ETH Zürich, SWITZERLAND and 2Zurich Instruments AG, SWITZERLAND

W.109e
OOCYTE MECHANICAL CHARACTERIZATION BY ROBOT INTEGRATED MICROFLUIDIC CHIP FOR HIGH-THROUGHPUT QUALITY EVALUATION
S. Sakuma1 and F. Arai2
1Osaka University, JAPAN and 2Nagoya University, JAPAN

W.110e
REAL-TIME SECRETION ANALYSIS REVEALED CORRELATION OF IL-β RELEASE AND LOSS OF CELL MEMBRANE INTEGRITY
Y. Shirasaki1, M. Yamagishi1, K. Izawa2, K. Nakagawa2, A. Nakahara3, N. Suzuki1, J. Mizuno3, T. Sekiguchi3, T. Heike2, R. Nishikomori2, S. Shoji3, and O. Ohara1
1Institute of Physical and Chemical Research (RIKEN), JAPAN, 2Kyoto University, JAPAN, and 3Waseda University, JAPAN

W.111e
SINGLE CELL TRACKING OF SYNECHOCYSTIS GROWTH IN A MICROFLUIDIC CULTURE DEVICE USING A PROBABILISTIC AUTOMATED IMAGE ANALYSIS TECHNIQUE
F. Yu, K. Song, M.A. Horowitz, and S.R. Quack
Stanford University, USA

Liposomes/Vesicles

W.112e
ACTIVE DRUG LOADING OF MICROFLUIDIC-SYNTHESIZED LIPOSOMES
R.R. Hood1, W.N. Vreeland2, and D.L. DeVoe1
1University of Maryland, USA and 2National Institute of Standards and Technology (NIST), USA

W.113e
ON THE DYNAMICS OF GIANT UNILAMELLAR VESICLES UNDER FLOW – TOWARDS A MODEL FOR SHEAR STRESS TRANSDUCTION ON CELLS
B. Sebastian and P.S. Dittrich
ETH Zürich, SWITZERLAND

W.114e
UNIFORM-SIZED PROTEOLIPOSOME FORMATION BY USING ELECTROSPIRAY FOR MICROSCOPIC MEMBRANE PROTEIN ASSAYS
T. Osaki1,2, K. Kamiya1, R. Kawano1, R. Iino2,3, H. Noji2,3, and S. Takeuchi1,2
1University of Tokyo, JAPAN, 2Kanagawa Academy of Science and Technology, JAPAN, and 3Japan Science and Technology Agency (JST), JAPAN

Stem Cells

W.115e
CULTIVATION OF HUMAN INDUCED PLURIPOTENT STEM CELLS WITH CONTROLLED AGGREGATE SIZE AND GEOMETRICAL ARRANGEMENT BY INVERTING MICROWELL ARRAY CHIP
T. Satoh1, S. Sugiu1, K. Sumaru1, S. Ozaki2, S. Gomi2, T. Kurakazu2, Y. Oshima2, and T. Kanamori1
1National Institute of Advanced Industrial Science and Technology (AIST), JAPAN and 2Tokyo Electron Limited, JAPAN

Cell-Surface Interaction

W.116e
CELL-SURFACE AFFINITY OF THE REFERENCE SURFACE IS KEY TO OBSERVE SPECIFIC CELL RESPONSES TO SUBSTRATE-BOUND CUES
McGill University, CANADA
W.117e
MICROSTRUCTURED THERMORESPONSIVE POLYMER COATINGS AS A PROMISING TOOL FOR CONTROLLING NEURITE OUTGROWTH IN ARTIFICIAL NEURONAL NETWORKS
M. Kirschbaum, G. Boerner, K. Uhlig, and C. Duschl
Fraunhofer IBMT, GERMANY

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

W.118e
ALGINATE ENCAPSULATION OF CELL-LADEN BEADS FOR MICROFLUIDIC TUMOR SPHEROID CULTURE
C. Bayly, L. Yu, and K.C. Cheung
University of British Columbia, CANADA

W.119e
COMPARATIVE MICROFLUIDIC CULTURING OF IMMOBILIZED SINGLE CELLS WITH ON-SITE FLUORESCENT-PROTEIN INDUCTION
Z. Zhu, O. Frey, D. Ottoz, F. Rudolf, and A. Hierlemann
ETH Zürich, SWITZERLAND

W.120e
MATRIGEL-ALGINATE CORE-SHELL BEADS FOR CONTROLLED TUMOR SPHEROID FORMATION
L. Yu, C. Bayly, and K. Cheung
University of British Columbia, CANADA

W.121e
MONO-, CO- AND MIXED CULTURE OF CELLS IN THE MICROSYSTEM FOR PHOTODYNAMIC THERAPY PROCEDURES
E. Jastrzebska, N. Bajkowska, K. Zukowski, M. Chudy, A. Dybko, and Z. Brzozka
Warsaw University of Technology, POLAND

W.122e
RECONSTRUCTION OF CAPILLARY NETWORKS IN HUVEC-MSC COCLUTURE CULTURED IN STATIC/FLOW CONDITIONS IN A MICROFLUIDIC PLATFORM
K. Tanimura, K. Yamamoto, and R. Sudo
Keio University, JAPAN

Inter- & Intracellular Signaling, Cell Migration

W.123e
A PDMS-SEALED HYDROGEL DEVICE FOR RAPID AND ACCURATE GENERATION OF VARIOUS CONCENTRATION GRADIENTS
M. Kim, M. Jia and T. Kim
Ulsan National Institute of Science and Technology (UNIST), SOUTH KOREA

W.124e
IN-SITU MONITORING TO MECHANOSTRESS RESPONSES USING MICROFLUIDIC DEVICE
Y. Nakashima¹, Y. Yang², and K. Minami²
¹Kumamoto University, JAPAN and ²Yamaguchi University, JAPAN

W.125e
ON-CHIP IMMUNOELECTROPHORESIS FOR EVALUATING SURFACE PROTEINS OF EXOSOMES AT SINGLE-PARTICLE LEVEL FOR DIAGNOSTIC APPLICATION
T. Akagi¹, K. Kato¹, N. Hanamura¹, M. Kobayashi¹, T. Ochiya², and T. Ichiki¹
¹University of Tokyo, JAPAN and ²National Cancer Center Research Institute, JAPAN

Others

W.126e
DIRECT ELECTROPORATION OF ADHERENT CELLS BY HYDROGEL-BASED MICROELECTRODES
M. Nishizawa¹ and K. Nagamine²
¹Tohoku University, JAPAN and ²Japan Science and Technology Agency (JST), JAPAN
PARALLEL cDNA SYNTHESIS FROM THOUSANDS OF INDIVIDUALLY ENCAPSULATED CANCER CELLS – TOWARDS LARGE SCALE SINGLE CELL GENE EXPRESSION ANALYSIS
L.M. Soderberg, H.N. Joensson, H. Andersson Svahn
Royal Institute of Technology (KTH), SWEDEN

TIME-LAPSE SCREENING BY PARALLELIZED LENSFREE IMAGING
V. Haguet, P. Obeïd, R. Griffin, D. Freida, L. Guyon, and X. Gidrol
1Commissariat à l'énergie atomique (CEA), FRANCE, 2INSERM, FRANCE, 3University Grenoble-Alpes, FRANCE, and 4CNRS, FRANCE

Organs & Organisms

Organs on Chip

1Institute for Bioengineering of Catalonia (IBEC), SPAIN, 2Centro de Investigación Biomédica en Red de Bioingeniería, Biomateriales y Nanomedicina, SPAIN, 3Barcelona Centre for International Health Research (CRESIB), SPAIN, 4Barcelona University, SPAIN and 5Institució Catalana de Recerca i Estudis Avançats (ICREA), SPAIN

ON-CHIP ABSORPTION AND METABOLISM MODEL FOR PHARMACOKINETIC STUDIES
H. Kimura, T. Ikeda, Y. Sakai, and T. Fujii
1Tokai University, JAPAN and 2University of Tokyo, JAPAN

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

ELECTROPHYSIOLOGICAL ANALYSIS OF NEMATODE LARVAE WITH AN INTEGRATED MICROFLUIDIC PLATFORM
C. Hu, V. O'Connor, L. Holden-Dye, and H. Morgan
University of Southampton, UK

ON-CHIP CHEMOTAXIS ASSAY OF PLANT-PARASITIC NEMATODE TOWARDS INCREASING GLOBAL CROP PRODUCTIVITY
H. Hida, H. Nishiyama, S. Sawa, T. Higashiyama, and H. Arata
1Japan Science and Technology Agency (JST), JAPAN, 2Kumamoto University, JAPAN, 3Nagoya University, JAPAN, and 4Kobe University, JAPAN

Diagnostics & Analytics

Sample Preparation (Whole blood, Saliva, Cells, Tissue, Food, etc.)

A NUCLEIC ACID EXTRACTION MEMBRANE FOR POINT OF CARE DEVICES
R.E. Mackay, N. Garg, P. Craw, J.C. Ahern, and W. Balachandran
Brunel University, UK

AUTOMATED WHOLE BLOOD PROCESSING WITH A PORTABLE MICROFLUIDIC DEVICE FOR POINT-OF-CARE DIAGNOSIS
H. Li, H. Jayamohan, C. Lambert, S. Mohanty, and B.K. Gale
University of Utah, USA
MICROFLUIDIC IMMUNOPHENOTYPING ASSAY PLATFORM FOR AND IMMUNOMONITORING OF
SUBPOPULATIONS OF IMMUNE CELLS
W. Chen, N. Huang, B. Oh, T.T. Cornell, T.P. Shanley, K. Kurabayashi, and J. Fu
University of Michigan, USA

PORTABLE DIGITAL MICROFLUIDIC/MASS SPECTROMETRY METHOD FOR QUANTIFICATION OF
DRUGS OF ABUSE IN URINE
N.M. Lafrenière¹, A.E. Kirby¹, B. Seale¹, E. Gritzan², J.T. Shelley², P.I. Hendricks², R.G. Cooks², and A.R. Wheeler¹
¹University of Toronto, CANADA and ²Purdue University, USA

Nucleic Acid Analysis (e.g. Digital PCR, Next Generation Sequencing)

DETECTION OF OIL-UTILIZING MICROORGANISMS BY NUCLEIC ACID SEQUENCE-BASED
AMPLIFICATION IN A TOTAL ANALYSIS LAB-ON-A-CHIP DEVICE
B.K. Honsvall¹², A. Ezkerra³⁴, and F. Karlsen¹⁵
¹Vestfold University College, NORWAY, ²Trilobite Microsystems AS, NORWAY, ³CIC MicroGUNE, SPAIN
⁴IK4-Ikerlan, SPAIN, and ⁵NorChip AS, NORWAY

FOIL-BASED DNA MELTING CURVE ANALYSIS PLATFORM FOR LOW-COST POINT-OF-CARE
MOLECULAR DIAGNOSTICS
A. Ohlander¹, S. Bauer¹, H. Ramachandraiah², A. Russom², and K. Bock¹
¹Fraunhofer Research Institution for Modular Solid State Technologies EMFT, GERMANY and
²KTH Royal Institute of Technology, SWEDEN

LEVERAGING PEPTIDE NUCLEIC ACID PROBES AND ISOTACHOPHORESIS FOR ON-CHIP HIGH
SENSITIVITY DETECTION OF DNA
N. Ostromohov, O. Schwartz, and M. Bercovici
Technion – Israel Institute of Technology, ISRAEL

ON-CHIP MULTIPLEX PCR AMPLIFICATION DIRECTLY FROM WHOLE BLOOD
R.S. Wiederkehr¹², B. Jones¹, S. Peeters¹, T. Stakenborg¹, O. Ibrahim³⁴, P. Fiorini¹, H. Tanaka⁵, I. Yamashita⁵, T. Matsuno⁵, and L. Lagae¹²
¹IMEC, BELGIUM, ²Katholieke Universiteit Leuven, BELGIUM, ³Alexandria University, Alexandria, EGYPT, ⁴Consortium Centre of Excellence for Nano-manufacturing Applications (CENA), SAUDI ARABIA, and ⁵Panasonic Corporation, JAPAN

THERMALLY-MULTIPLEXED MICROFLUIDIC PCR
C.R. Phaneuf¹, N. Pak¹, D.C. Saunders¹, E. Popler², N. Nagpal¹, R. Jerris³, A. Shane², and C.R. Forest¹
¹Georgia Institute of Technology, USA, ²Emory University, USA, and ³Children’s Healthcare of Atlanta, USA

Protein Analysis & Characterization (e.g. Proteomics)

INTEGRATED MICROFLUIDIC FEMTOLITER ARRAY FOR QUANTITATIVE ELISA AT THE ATTOMOLAR
LEVEL
Y. Zeng and T. Wang
University of Kansas, USA

MICROFLUIDICS TO ISOLATE UNTAGGED PROTEINS FROM CELL EXTRACTS FOR VISUAL ANALYSIS
BY ELECTRON MICROSCOPY
D. Giss, S. Kemmerling, V. Dandey, H. Stahlberg, T. Braun
University of Basel, SWITZERLAND
Clinical Chemistry

W.144g
TOWARDS A HIGH-THROUGHPUT, DROPLET-BASED VIRAL-FUSION ASSAY WITH SINGLE-PARTICLE SENSITIVITY
S. Mashaghi and A.M. van Oijen
University of Groningen, THE NETHERLANDS

W.145g
AN OPTICAL LAB-ON-A-CHIP SYSTEM BASED ON SPR SENSOR FOR CONTINUOUS GLUCOSE MONITORING
D. Li, H. Yu, J. Wu, D. Yang, and K. Xu
Tianjin University, CHINA

W.146g
QUANTITATIVE DETERMINATION OF BRANCHED-CHAIN AMINO ACIDS IN HUMAN PLASMA USING PRESSURE-DRIVEN LIQUID CHROMATOGRAPHY WITH PILLAR ARRAY COLUMNS
Y. Song1, K. Takatsuki2, M. Isokawa1, T. Sekiguchi2, J. Mizuno2, T. Funatsu1, S. Shoji2, and M. Tsunoda1
1University of Tokyo, JAPAN and 2Waseda University, JAPAN

Drug Development

W.147g
ELECTRICAL IMPEDANCE SPECTROSCOPY FOR LABEL-FREE, CONTINUOUS MONITORING OF DRUG IMPACT ON 3D TISSUE SPHEROIDS
S.C. Bürgel, J.Y. Kim, A. Hierlemann, and O. Frey
ETH Zürich, SWITZERLAND

Others

W.148g
KINETIC MEASUREMENTS USING THE FREQUENCY REPONSE OF INTERACTING BIOMOLECULES SUBJECTED TO A THERMAL MODULATION
K. Bournine, X. Zhao, and C. Gosse
CNRS, FRANCE

W.149g
RAPID AND HIGH SENSITIVITY MALARIA DIAGNOSIS: A MICROFLUIDICS APPROACH
T.F. Kong1,2, W.K. Peng1, H.W. Hou1, Marcos1, N.T. Nguyen1,2,3, and J. Han1,4
1Singapore-MIT Alliance for Research and Technology (SMART), SINGAPORE, 2Nanyang Technological University, SINGAPORE, 3Griffith University, AUSTRALIA, and 4Massachusetts Institute of Technology, USA

Medical Research & Applications

Cancer Research

W.150h
DETECTION AND QUANTIFICATION OF MINORITY KRAS SUBCLONES IN TUMORS USING DROPLET-BASED MICROFLUIDICS: CLINICAL IMPLICATION
D. Pekin1,2, C. Normand1, S. Kotsopoulos1, X. Li3, L. Benhaim1, O. Bouché4, T. Lecomte5, D. Le Corre1, T. Hor1, Z. El Harrak1, P. Nizard1, D. Link1, J.B. Hutchison3, P. Laurent-Puig1, and V. Taly1
1University Paris Descartes, FRANCE, 2Université de Strasbourg, FRANCE, 3Raindance Technologies, USA, 4Centre Hospitalier Universitaire de Reims, FRANCE, and 5Université de Tours, FRANCE

W.151h
INVESTIGATION OF ENDOTHELIAL GROWTH USING A POLYCARBONATE BASED MICROFLUIDIC CHIP AS ARTIFICIAL BLOOD CAPILLARY VESSEL WITH INTEGRATED IMPEDANCE SENSORS FOR APPLICATION IN CANCER RESEARCH
T. Rajabi1, V. Huck2, R. Ahrens1, Ch. Bassing1, J. Fauser1, S.W. Schneider2, and A.E. Guber1
1Karlsruhe Institute of Technology, GERMANY and 2Heidelberg University, GERMANY
STREAMLINING CELL BIOLOGY WORKFLOWS: INTEGRATING SUSPENSION CULTURE, CELL LYSIS, PROTEIN EXTRACTION AND NUCLEIC ACID EXTRACTION
T.E. de Groot, B.P. Casavant, K.S. Vesterat, L.N. Strotman, S.M. Berry, and D.J. Beebe
University of Wisconsin, USA

Personalized Medicine

MULTIPLEX DETECTION OF KRAS POINT MUTATIONS FROM TUMOR CELL DNA ON A CENTRIFUGAL MICROFLUIDIC CARTRIDGE (GENESLICE) FOR CHOICE OF PERSONALIZED CANCER THERAPY
O. Strohmeier1,2, S. Laßmann3,4,5,6, B. Riedel3,6, M. Werner3,5,6, D. Mark1, R. Zengerle1,2,4, and F. von Stetten1,2
1Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY, 2University of Freiburg - IMTEK, GERMANY, 3University Medical Center Freiburg, GERMANY, 4University of Freiburg - BIOSS, GERMANY, 5Comprehensive Cancer Center Freiburg, GERMANY, and 6German Cancer Consortium (DKTK) and German Cancer Research Center (DKFZ), GERMANY

Drug Delivery Systems

CHARACTERIZATION OF NANOPARTICLE PERMEABILITY ON A MEMBRANE-INTEGRATED MICROFLUIDIC DEVICE
1Toyo University, JAPAN, 2Japan Women's University, JAPAN, 3University of Tokyo, JAPAN, and 4Kyushu University, JAPAN

MICROFLUIDIC DEVICE FOR MICROINJECTION OF CAENORHABDITIS ELEGANS
R. Ghaemi, J. Tong, P.R. Selvaganapathy, and B.P. Gupta
McMaster University, CANADA

SINGLE-STEP DRUG CRYSTALLIZATION AND FORMULATION - 'DESIGNER' PHARMACEUTICALS ENABLED BY MICROFLUIDICS
R.A.L. Leon1, W.Y. Wan1, A.Z.M. Badruddoza1, T.A. Hatton2,3, and S.A. Khan1,2
1National University of Singapore, SINGAPORE, 2Singapore-MIT Alliance for Research and Technology (SMART), SINGAPORE and 3Massachusetts Institute of Technology, SINGAPORE

Regenerative Medicine & Tissue Engineering

ENGINEERING OF THREE-DIMENSIONAL LIVER MICRO-TISSUE CONTAINING SINUSOIDAL ULTRASTRUCTURE THROUGH HETEROTYPIC CELL-CELL INTERACTIONS
D.Y. No, S.A. Lee, and S.H. Lee
Korea University, SOUTH KOREA

MATHEMATICAL MODELING FOR THE SELF-ORGANIZATION OF CELLS
N. Kojima1, Y. Ogata2, S. Nakaoka3, and Y. Sakai1
1Yokohama City University, JAPAN, 2University of Tokyo, JAPAN, and 3Riken Yokohama Institute, JAPAN

SKIN PRINTER: MICROFLUIDIC APPROACH FOR SKIN REGENERATION AND WOUND DRESSINGS
L. Leng1, S. Amini-Nik1,2, Q. Ba1, M. Jeschke1,2, and A. Günther1
1University of Toronto, CANADA and 2Sunnybrook Health Sciences Centre, CANADA
Implantable and Surgical Microdevices

W.160h
LONG-TERM IMPLANTATION OF PRIMARY ISLET CELL-ENCAPSULATING HYDROGEL MICROFIBERS IN DIABETIC MICE
H. Onoe, T. Okitsu, A. Itou, and S. Takeuchi
University of Tokyo and Japan Science and Technology Agency (JST), JAPAN

Devices for Better Quality-of-Life (QOL)

W.161h
AUTONOMOUS DEVICE WITH APPLICATION IN LATE-PHASE HEMORRHAGIC SHOCK PREVENTION
V. Oncescu, S. Lee, A. Gumus, K. Karlsson, and D. Erickson
Cornell University, USA

W.162h
SKIN-EMITTED ACETONE DETECTION TOWARD SELF-MONITORING OF FAT METABOLISMS
Y. Yamada, S. Hiyama, T. Toyooka, H. Onoe, and S. Takeuchi
1NTT DOCOMO, Inc., JAPAN and 2University of Tokyo, JAPAN

Others

W.163h
A NOVEL MICROFLUIDIC “CELL-BASED” BLOOD DIALYSIS PLATFORM FOR MURINE MODEL OF SEPSIS
H.W. Hou, M.P. Vera, B.D. Levy, R.M. Baron, and J. Han
1Massachusetts Institute of Technology, USA and 2Brigham and Women’s Hospital, and Harvard Medical School, USA

Separation Technologies

Electrophoretic Separations

W.164i
CHARACTERIZATION OF SIALYLATED GLYCANS BY COVALENT DERIVATIZATION AND MICROCHIP ELECTROPHORESIS
I. Mitra, C.M. Snyder, W.R. Alley, M.V. Novotny, and S.C. Jacobson
Indiana University, USA

W.165i
DROPLET-BASED COMPARTMENTALIZATION AFTER ISOELECTRIC FOCUSING IN A SLIPCHIP
Y. Zhao, F. Pereira, A. de Mello, H. Morgan, and X. Niu
1University of Southampton, UK, and 2ETH Zürich, SWITZERLAND

W.166i
ELECTROOSMOTICALLY ACTUATED ON-CHIP SOLID-PHASE EXTRACTION WITH MICROCHIP ELECTROPHORESISELECTROSPRAY IONIZATION MASS SPECTROMETRY
N. Nordman, B. Barrios-Lopez, S. Laurén, P. Suvanto, T. Kotiaho, S. Franssila, R. Kostiainen, and T. Sikanen
1University of Helsinki, FINLAND and 2Aalto University, FINLAND

W.167i
HYDRODYNAMIC CONTROL FOR NON-BIASED INJECTION AND SIMULTANEOUS COMPLEMENTARY ANALYSIS
A.J. Gaudry, M.C. Breadmore, and R.M. Guijt
University of Tasmania, AUSTRALIA

W.168i
MEASURING THE EFFECT OF CRYSTALLINE ORDER ON DNA ELECTROPHORESIS IN COLLOIDAL CRYSTALS
S.B. King and K.D. Dorfman
University of Minnesota, USA
W.169i
TUNING THE MOBILITY OF FLUORESCENT, DNA-TEMPLATED, SILVER NANoclUSTERS FOR ELECTROPHORETIC SEPARATIONS IN MICROCHANNELS
J.T. Del Bonis-O'Donnell, D. Fygenson, and S. Pennathur
University of California, Santa Barbara, USA

Chromatographic Separations

W.170i
DEVELOPMENT OF MILLION PLATES LIQUID CHROMATOGRAPHY USING EXTENDED-NANO CHANNEL
Y. Liu, H. Shimizu, A. Smirnova, K. Mawatari, and T. Kitamori
University of Tokyo and Japan Science and Technology Agency (JST), JAPAN

Particle Separations

W.171i
A LOW-POWER AND SMALL-VOLUME PARTICLE SEPARATION DEVICE BASED ON CIRCULAR TRAVELLING-WAVE ELECTROOSMOSIS
S.-C. Lin¹, Y.-L. Sung¹, Y.-C. Tung², and C.-T. Lin¹
¹National Taiwan University, TAIWAN and ²Academia Sinica, TAIWAN

W.172i
HAND-HELD BLOOD SEPARATION MICROFLUIDIC CHIP
L. Xu, H. Lee, and K.W. Oh
University of Buffalo, USA

W.173i
LOW CONCENTRATION OIL SEPARATION AND DETECTION FROM ENVIRONMENTAL WATER SAMPLES THROUGH ACOUSTOPHORESIS
H. Wang¹, S. Kim¹, C. Koo¹, Y. Cho², Y.-J. Kim¹, and A. Han¹
¹Texas A&M University, USA and ²Seoul National University of Science and Technology, SOUTH KOREA

Microreaction Technology & Synthesis

Microreactors & Micromixers

W.174j
AN ULTRA-LOW CONSUMPTION PLATFORM FOR MEASURING FAST CHEMICAL REACTIONS
E. Fradet, P. Abbyad, and C.N. Baroud
Ecole Polytechnique, FRANCE

W.175j
LOGIC OPERATION IN DNA NANO DEVICE: ELECTRICAL INPUT/OUTPUT THROUGH BIOLOGICAL NANOPORES
K. Inoue¹, R. Kawano¹, H. Yasuga¹, M. Takinoue³, T. Osaki¹,², K. Kamiya¹, N. Miki¹,³, and S. Takeuchi¹,²
¹Kanagawa Academy of Science and Technology, JAPAN, ²University of Tokyo, JAPAN, ³Keio University, JAPAN, and ⁴Tokyo Institute of Technology, JAPAN

W.176j
TRANSPARENT P(VDF-TRFE) TRANSDUCER-BASED ACOUSTIC STREAMING FOR MICROFLUIDIC APPLICATIONS
V.F. Cardoso, L. Rebouta, S. Lanceros-Méndez, and G. Minas
University of Minho, PORTUGAL

Filtering & Separation

W.177j
NANOWIRE DEVICES FOR EXOSOMAL MICRORNA EXTRACTION
S. Ito¹, T. Yasui¹, H. Yong², T. Yanagida³, S. Rahong², M. Kanai², K. Nagashima², H. Yukawa¹, N. Kaji¹, T. Kawai², and Y. Baba¹,³
¹Nagoya University, JAPAN, ²Osaka University, JAPAN, and
³National Institute of Advanced Industrial Science and Technology, (AIST), JAPAN

Chemical Synthesis

W.178j
COPPER COMPLEXATION OF MACROCYCLIC MOLECULES: TOWARDS ON-CHIP RADIOMETALLIC LABELLING OF PET RADIOTRACERS
M.D. Tarn, B. Lu, R. Smith, B.P. Burke, S.J. Archibald, and N. Pamme
University of Hull, UK

W.179j
MULTI-PASS NANOCRYSTAL PROCESSOR
M. Abolhasani, Y. Hassan, E. Kumacheva, G. Scholes, and A. Günther
University of Toronto, CANADA

Particle Synthesis

W.180j
POLYPLEX SYNTHESIS BY "MICROFLUIDIC DRIFTING" BASED THREE-DIMENSIONAL HYDRODYNAMIC FOCUSING METHOD
M. Lu¹, Y.-P. Ho²,³, C.L. Grigsby², A.A. Nawaz¹, P.-H. Huang¹, K.W. Leong², and T.J. Huang¹
¹Pennsylvania State University, USA, ²Duke University, USA, and
³Interdisciplinary Nanoscience Center (iNANO), DENMARK

Applications to Green & Environmental Technologies

Fuel Cells

W.181k
DEVELOPMENT OF A MICRO FUEL CELL DEVICE BASED ON THE MICROFLUIDIC CHIP
Y. Pihosh¹,², H. Chinen¹, K. Mawatari¹,², and T. Kitamori¹,²
¹University of Tokyo, JAPAN and ²Japan Science and Technology Agency (JST), JAPAN

Water/Air/Soil Management

W.182k
LOW-COST PAPER MICROFLUIDICS FOR ECOTOXICOLOGICAL ANALYSIS
J. Petr, P. Svobodová, L. Vojtková, A. Suchomelová, A. Příbylka, and R. Knob
Palacký University, Olomouc, CZECH REPUBLIC

Other Energy/Power Devices

W.183k
GATE CONTROLLED HIGH EFFICIENCY BALLISTIC ENERGY CONVERSION SYSTEM
Y. Xie, D. Bos, H. de Boer, A. van den Berg, and J.C.T. Eijkel
MESA+, University of Twente, THE NETHERLANDS

MicroTAS for Other Applications

Synthetic Biology

W.184l
PATTERNING AND FUNCTIONALIZATION OF THERMOPLASTIC MICROCHIP FOR AUTOMATED HIGH-THROUGHPUT MICROARRAY GENE SYNTHESIS
S. Ma, I.A. Saaem, and J. Tian
Duke University, USA
Integrative Biology, Systems Biology

W.185l
FATE MANIPULATION OF PC-12 CELL USING MICROFLUIDIC DEVICE
H. Ryu1, M. Chung1, S.S. Lee2, N.L. Jeon1, and O. Pertz3
1Seoul National University, SOUTH KOREA, 2ETH Zurich, SWITZERLAND, and 3University of Basel, SWITZERLAND

Bioinspired, Biomimetic & Biohybrid Devices

W.186l
DROPLET-BOX: A PLATFORM FOR BIOLOGICAL-NANOPORE-BASED LOGICAL OPERATION USING LIPID-COATED DROPLET NETWORK
H. Yasuga1,3, R. Kawano1, M. Takinoue4, Y. Tsuji1, T. Osaki1,2, K. Kamiya1, N. Miki1,3, and S. Takeuchi1,2
1Kanagawa Academy of Science and Technology, JAPAN, 2University of Tokyo, JAPAN, 3Keio University, JAPAN, and 4Tokyo Institute of Technology, JAPAN

W.187l
NATURAL LEAF REPLICAS TO STUDY CELL CONTACT GUIDANCE
L. MacQueen, Z. Gong, B. Chen, J. Liu, H. Liu, C. Simmons, and Y. Sun
University of Toronto, CANADA

Bioprocess Technology

W.188l
MICROALGAL CULTURE, LIPID PRODUCTION AND EXTRACTION USING AN INTEGRATED MICROFLUIDIC SYSTEM
H.S. Lim, J.Y.H. Kim, H.S. Kwak, and S.J. Sim
Korea University, SOUTH KOREA

Food & Nutrition

W.189l
AUTOMATED ON-SITE DETECTION OF ORGANOPHOSPHOROUS PESTICIDES IN REAL FOOD SAMPLES
L. Drechsel1, M. Schulz1, F. von Stetten1,2, R. Zengerle1,2,3, and N. Paust1,2
1Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY, 2University of Freiburg – IMTEK, GERMANY, 3University of Freiburg – BIOSS, GERMANY

16:00 - 16:30 Break and Exhibit Inspection

Session 3A3 - Single Cell Processing and Analysis 2

16:30 - 16:50 TOWARDS A MICROFLUIDIC SINGLE-CELL IMMUNE CHIP
M. Junkin, A. Kaestli, and S. Tay
ETH Zürich, SWITZERLAND

16:50 - 17:10 OPTICAL CELL PICKING IN PHOTODEGRADABLE HYDROGELS BASED ON CELLULAR MORPHOLOGY IN 3D CULTURE ENVIRONMENT
M. Tamura1, F. Yanagawa2, S. Sugiura3, T. Takagi2, K. Sumaru2, H. Matsui1, and T. Kanamori2
1University of Tsukuba, JAPAN and 2National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

17:10 - 17:30 CIRCUMFERENTIAL MOLECULAR DELIVERY INTO SINGLE CELLS VIA CELL-ROLLING MEDIATED ELECTROPORATION IN MICROFLUIDIC CHANNELS
Rutgers, State University of New Jersey, USA

17:30 - 17:50 LIPID SCREENING IN SINGLE MICROALGAE USING HYDROGEL MICROCAPSULE ARRAYS
D.-H. Lee, J.-I. Han, and J.-K. Park
Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA
Session 3B3 - Droplets

16:30 - 16:50
SHAKEN, AND STIRRED
M. Abolhasani, A. Oskooei, E. Kumacheva, and A. Günther
University of Toronto, CANADA

16:50 - 17:10
DROPLET INCUBATION CHAMBER ARRAY: JOURNEY OF DROPLETS ON A CHIP
H.S. Rho, and H. Gardeniers
MESA+, University of Twente, THE NETHERLANDS

17:10 - 17:30
AUTOSIZING, CLOSED-LOOP DROP GENERATOR USING MORPHOMETRIC IMAGE FEEDBACK
R. Kebriaei and A.S. Basu
Wayne State University, USA

17:30 - 17:50
CHARACTERIZATION OF DYE LEAKAGE IN MICROFLUIDIC DROPLETS
Y. Chen, M. Pan and S.K.Y. Tang
Stanford University, USA

Session 3C3 - Tools for Cancer Analysis

16:30 - 16:50
MICROENGINEERED HYDROGEL FIBERS FOR EVALUATING CANCER CELL INVASION UNDER 3D
COculture CONDITIONS
Y. Kitagawa, M. Yamada, and M. Seki
Chiba University, JAPAN

16:50 - 17:10
CANCER CELL-SPECIFIC OLIGOPEPTIDE SELECTED BY MICROFLUIDIC SYSTEM FROM A PHAGE
DISPLAY LIBRARY FOR OVARIAN CANCER DIAGNOSIS
C.H. Wang¹, C.-H. Weng², Y.-J. Che¹, K. Wang³, and G.-B. Lee¹
¹National Tsing Hua University, TAIWAN, ²National Cheng Kung University, TAIWAN, and Academia Sinica, TAIWAN

17:10 - 17:30
UNDERSTANDING TUMOR HETEROGENEITY AS AN ENCOURAGER FOR CANCER METASTASIS (IN
VITRO MODEL OF TUMOR HETEROGENEITY)
Y. Shin and S. Chung
Korea University, SOUTH KOREA

17:30 - 17:50
MULTIPLEX REAL-TIME MONITORING OF CELLULAR METABOLIC ACTIVITY USING A REDOX-
REACTIVE NANOWIRE BIOSENSOR
L.C. Hsiung, V. Krivitsky, V. Naddaka, Y.K. Conroy, H. Peretz-Soroka, and F. Patolsky
Tel Aviv University, ISRAEL

19:00 - 23:00  Conference Banquet
Thursday 31 October

08:30 - 08:45  Announcements

08:45 - 09:30  Plenary Presentation VIII
FROM SINGLE CELLS TO ARTIFICIAL CELLS: HOW MICROFLUIDICS CAN CONTRIBUTE TO A BETTER UNDERSTANDING OF CELLULAR PROCESSES
Petra S. Dittrich
ETH Zürich, SWITZERLAND

Session 4A1 - Nucleic Acid Processing

09:45 - 10:05  ISOTHERMAL AMPLIFICATION OF DNA ON TIPS OF SILICON NANOTWEEZERS AND IT'S ELECTRICAL AND MECHANICAL CHARACTERIZATION
M. Kuumemura¹, S.L. Karsten², N. Lafitte³, H. Guillou³, L. Jalabert¹, H. Fujita¹, and D. Collard¹,4
¹LIMMS-CNRS-IIS, JAPAN, ²NeuroInDx. Inc., USA, ³CNRS, FRANCE, and ⁴University of Tokyo, JAPAN

10:05 - 10:25  NON-INVASIVE HANDLING OF CHROMATIN FIBERS ISOLATED FROM INDIVIDUAL CELLS IN A MICROCHANNEL UTILIZING AN OPTICALLY DRIVEN MICROTOOL –TOWARD DIRECT EPIGENETIC ANALYSIS BY MICROSCOPY–
H. Oana¹, K. Nishikawa¹, H. Matsuhara², A. Yamamoto², T.G. Yamamoto³, T. Haraguchi³, Y. Hiraoka⁴, and M. Washizu¹
¹University of Tokyo, JAPAN, ²Shizuoka University, JAPAN, ³National Institute of Information and Communications Technology (NICT), JAPAN, and ⁴Osaka University, JAPAN

10:25 - 10:45  DRY SAMPLE PRESERVATION USING A SLIPCHIP
S. Begolo¹, F. Shen² and R.F. Ismagilov¹
¹California Institute of Technology, USA and ²Slipchip LLC, USA

Session 4B1 - Molecular Separation

09:45 - 10:05  DEVELOPMENT OF SUBSECOND TIME-SCALE LIQUID-LIQUID EXTRACTION PROCESSES UTILIZING MONODISPERSE MICROFLUIDIC DROPLETS
S. Kakegawa, M. Yamada, M. Mizuno, N. Nakajima, and M. Seki
Chiba University, JAPAN

10:05 - 10:25  ULTRA HIGH FLEXIBLE UV-VIS RADIATION SOURCE AND NOVEL DETECTION SCHEMES FOR SPECTROPHOTOMETRIC HPLC DETECTION
K. Kraiczek¹, R. Bonjour², Y. Salvadé², and R. Zengerle³,4
¹Agilent Technologies, GERMANY, ²University of Applied Sciences, SWITZERLAND, and ³University of Freiburg - IMTEK, GERMANY

10:25 - 10:45  CUSTOMIZED HPLC IN GLASS CHIPS
S. Thürmann, and D. Belder
Universität Leipzig, GERMANY

Session 4C1 - Neurobiology

09:45 - 10:05  CONTACTLESS THREE-DIMENSIONAL GUIDANCE OF AXONAL GROWTH
T. Honegger, M. Thielen, and J. Voldman
Massachusetts Institute of Technology, USA

10:05 - 10:25  MOBILE MICROPLATES FOR HANDLING MORPHOLOGICALLY CONTROLLED SINGLE NEURAL CELLS
S. Yoshida¹, T. Teshima¹, K. Kuribayashi-Shigetomi¹, and S. Takeuchi¹,2
¹University of Tokyo, JAPAN and ²Japan Science and Technology Agency (JST), JAPAN
ANALYSIS OF AXON GUIDANCE IN SINGLE NEURONS USING A LARGE ARRAY OF MICROFLUIDIC GRADIENT GENERATORS
N. Bhattacharjee, and A. Folch
University of Washington, USA

Break and Exhibit Inspection

Session 4A2 - Spatial Control of Chemistry

COAXIAL TURBULENT JET MIXER FOR CONTROLLED SYNTHESIS OF NANOPARTICLES
J.-M. Lim1, L.M. Gilson1, S. Chopra1, R.S. Langer1, O.C. Farokhzad2, and R. Karnik1
1Massachusetts Institute of Technology, USA and 2Brigham and Women's Hospital, USA

TUNABLE MICROFLUIDIC GRADIENT GENERATOR VIA ACOUSTICALLY OSCILLATED SHARP EDGES
P.H. Huang1, C.Y. Chan1, D. Ahmed1, Y. Xie1, L. Wang2, and T.J. Huang1
1Pennsylvania State University, USA and 2Ascent Bio-Nano Technologies Inc., USA

PARTICLE SEPARATION, CHEMICAL GRADIENT CONTROL AND MICROMIXING VIA FOCUSED TRAVELLING SURFACE ACOUSTIC WAVES (F-TSAW)
G. Destgeer1, S. Im1, J.H. Jung1, B.H. Ha1, H.W. Kang1, K.H. Lee1, M.A. Ansari1, A. Alazzam2, and H.J. Sung1
1Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA and
2Khalifa University of Science, Technology & Research (KUSTAR), UAE

Session 4B2 - Cell Biology

HYDROGEL DROPLET PLATFORM FOR HIGH-THROUGHPUT, HIGH-RESOLUTION IMAGING AND SORTING OF EARLY LARVAL CAENORHABDITIS ELEGANS
G. Aubry, M. Zhan, and H. Lu
Georgia Institute of Technology, USA

NEUTROPHILS MIGRATE LONGER DISTANCES IN MOVING MICROFLUIDIC CONCENTRATION GRADIENTS COMPARED TO STATIC ONES
M.A. Qasaimeh, M. Astolfi, M. Pyzik, S. Vidal, and D. Juncker
McGill University, CANADA

DISPOSABLE MICROFLUIDIC CHIP WITH INTEGRATED LIGHT SHEET ILLUMINATION ENABLES DIAGNOSTICS BASED ON MEMBRANE VESICLES
H. Deschout1, K. Raemdonck1, S. Stremersch1, P. Maoddi2, G. Mernier3, P. Renaud3, S. Jiguet2, A. Hendrix3, M. Bracke3, R. Van den Broecke3, M. Röding3, M. Rudemo4, J. Demeester1, S. De Smedt1, F. Strubbe1, K. Neyts1, and K. Braeckmans1
1Ghent University, BELGIUM, 2Ecole Polytechnique Fédérale de Lausanne, SWITZERLAND,
3Ghent University Hospital, BELGIUM, and 4Chalmers University of Technology, SWEDEN

PULSED STIMULATION VIA MICROFLUIDICS REVEALS SHORT AND LONG-TERM MEMORIES IN MAST CELLS
Y. Liu1, W.S. Hlavacek2, B.R. Schudel1, A. Mahajan, C.H. Hayden1, D.S. Lidke2, B.W. Wilson2, and A.K. Singh1
1Sandia National Laboratory, USA, 2Los Alamos National Laboratory, USA, and 3University of New Mexico, USA
Session 4C2 - Tissue Engineering

11:15 - 11:35
HANGING MICROFLUIDICS: A HIGHLY VERSATILE PLATFORM FOR PRODUCTION AND CULTIVATION OF 3D SPHERICAL MICROTISSUES
O. Frey, P.M. Misun, and A. Hierlemann
ETH Zürich, SWITZERLAND

11:35 - 11:55
MICROFLUIDIC TISSUE: A BIODEGRADABLE SCAFFOLD WITH BUILT-IN VASCULATURE FOR CARDIAC TISSUE VASCULARIZATION AND SURGICAL VASCULAR ANASTOMOSIS
B. Zhang, M. Montgomery, A. Pahnke, L. Reis, S.S. Nunes, and M. Radisic
University of Toronto, CANADA

11:55 - 12:15
CURVATURE-INDUCED SPONTANEOUS DETACHMENT OF VASCULAR SMOOTH MUSCLE CELL SHEETS: TOWARDS VASCULAR SELF ASSEMBLY IN MICROCHANNELS
T. Yamashita¹, P. Kollmannsberger², K. Mawatari¹,³, V. Vogel², and T. Kitamori¹,³
¹University of Tokyo, JAPAN, ²ETH Zurich, SWITZERLAND, and ³Japan Science and Technology Agency (JST), JAPAN

12:15 - 12:35
MICROFLUIDIC PERFUSION CULTIVATION SYSTEM FOR A MULTILAYER STRUCTURED TUBULAR TISSUES
Y. Yamagishi¹, T. Masuda¹, N. Takei¹, M. Matsusaki², M. Akashi², and F. Arai¹
¹Nagoya University, JAPAN and ²Osaka University, JAPAN

12:45 - 13:05  MicroTAS 2014 Announcement
13:05 - 13:20  Poster Award Session
13:20 - 13:35  MicroTAS Arts in Science Award
13:35  CONFERENCE ADJOUNS