



The 17th International Conference on Miniaturized Systems for Chemistry and Life Sciences

μTAS 2013



FREIBURG-BLACK FOREST

GERMANY

27-31 OCTOBER 2013

Technical Program

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 NANOCANNELS
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. Beech¹, L. Nyberg², J. Fritzsche², F. Westerlund², and J.O. Tegenfeldt¹
¹Lund University, SWEDEN and ²Chalmers University, SWEDEN

10:25 - 10:45
MICROFLUIDIC PARALLEL STRETCHING AND STAMPING OF SINGLE DNA MOLECULES FOR SUPER RESOLUTION MICROSCOPE IMAGING
H. Yasaki¹, D. Onoshima¹, T. Yasui¹, T. Naito², N. Kaji¹, and Y. Baba^{1,3}
¹Nagoya University, JAPAN, ²Kyoto University, JAPAN, and ³National 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 Brink¹, L. Büter², M. Odijk¹, W. Olthuis¹, U. Karst², and A. van den Berg¹
¹MESA+, University of Twente, THE NETHERLANDS and ²University of Münster, GERMANY

10:05 - 10:25
SELF-POWERED MOBILE SENSOR FOR IN-PIPE POTABLE WATER QUALITY MONITORING
R. Wu¹, W.W.A. Wan Salim¹, S. Malhotra¹, A. Brovont¹, J.H. Park¹, S.D. Pekarek¹, M.K. Banks², and D.M. Porterfield^{1,3}
¹Purdue University, USA, ²Texas A&M University, USA, and ³NASA 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. Saha^{2,3}, M.E. Godla¹, E.D. Pratt¹, A.D. Rhim^{2,3}, 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. Guan^{1,2}, M.E. Warkiani¹, K.B. Luan², C.T. Lim^{1,2}, P.C.Y. Chen^{1,2}, and J. Han^{1,3}

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. Yanagida², M. Kanai², K. Nagashima², T. Kawai², and Y. Baba^{1,3}

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. Osaki^{1,3}, K. Kamiya¹, K. Asami², S. Futaki², S. Takeuchi^{1,3}

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. Ahmad^{1,2}, Y. Wang¹, P.K. Shah^{1,2}, C.E. Sims¹, S.T. Magness¹, and N.L. Allbritton^{1,2}

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. Xing^{1,2}, S. Xu^{2,3}, and H. Yu^{1,2,3}

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-JETTING

S. Xiong¹, T. Tandon², C.D. Ohl¹, and A.Q. Liu¹

¹Nanyang Technological University, SINGAPORE and ²Institute of High Performance Computing, A*STAR, SINGAPORE

M.006a**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

M.007a**MASS TRANSPORT IN EMULSION STUDIED IN A ONE-DIMENSIONAL MICROARRAY**

P. Gruner¹, B. Semin², J. Lim¹, and J.C. Baret¹

¹*Max-Planck-Institute for Dynamics and Self-Organization, GERMANY* and ²*Laboratoire de Physique Statistique, FRANCE*

M.008a**ON-DEMAND CONTROL OF PH IN MICROFLUIDIC DROPLETS**

H.B. Zhou^{1,2} and S.H. Yao¹

¹*Hong Kong University of Science & Technology, CHINA* and ²*Chinese Academy of Science, CHINA*

M.009a**PRODUCTION OF MONODISPERSE BULK EMULSIONS IN A BEAKER USING A NOVEL MICROFLUIDIC DEVICE**

R. Dangla and C.N. Baroud

Ecole Polytechnique, FRANCE

M.010a**TUNABLE FABRICATION OF MICROFLUIDIC EMULSIONS BY SPINODAL DECOMPOSITION**

S.K. Yap¹, A.Z.M. Badruddoza¹, and S.A. Khan^{1,2}

¹*National University of Singapore, SINGAPORE* and

²*Singapore-MIT Alliance for Research and Technology (SMART), SINGAPORE*

Optofluidics**M.011a****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

M.012a**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

¹*University of Michigan, USA* and ²*Hongik University, SOUTH KOREA*

M.013a**OPTICAL MANIPULATION OF MICROPARTICLES IN OPTOFLUIDIC WAVEGUIDES**

Y.Z. Shi¹, Y. Yang², and A.Q. Liu^{1,2}

¹*Xi'an Jiao Tong University, CHINA* and ²*Nanyang Technological University, SINGAPORE*

Magnetofluidics (Magnetic Particles & Related Phenomena)**M.014a****MANIPULATION OF MAGNETIC PARTICLES IN μ -FLUIDIC VOLUMES**

Y. Gao^{1,2}, A. van Reenen^{1,2}, M.A. Hulsen¹, A.M. de Jong¹, M.W.J. Prins¹, and J.M.J. den Toonder¹

¹*Eindhoven University of Technology, THE NETHERLANDS* and ²*Philips Research, THE NETHERLANDS*

Acoustic Phenomena (BULK & Surface Based)**M.015a****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. Mawatari^{1,2}, and T. Kitamori^{1,2}

¹*University of Tokyo and* ²*Japan 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

¹*University of Tokyo, JAPAN and* ²*Kyoto 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. Hart^{1,2}

¹*University of Michigan, USA and* ²*Massachusetts 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

¹*Karlsruhe Institute of Technology, GERMANY and* ²*Bürkert Fluid Control Systems GmbH & Co. KG, GERMANY*

M.025b

ONE-STEP MICROARRAY FABRICATION OF UV-PHOTOPRINTABLE IONOGENS FOR BIOMOLECULE IMMOBILIZATION ON NON-MODIFIED COP AND COC MICROFLUIDIC CHIPS

M. Tijero^{1,2}, F. Benito-López¹, R. Díez-Ahedo^{1,3}, L. Basabe-Desmonts^{1,4}, and V. Castro-López¹

¹*CIC microGUNE, SPAIN,* ²*IK4-ikerlan, SPAIN,* ³*IK4-TEKNIKER, SPAIN, and* ⁴*IKERBASQUE, 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
¹*Universidad Nacional de Colombia Bogota, COLOMBIA*, ²*Freiburg Institute for Advanced Studies (FRIAS), GERMANY*,
³*Institut de Science des Matériaux de Mulhouse, FRANCE*, and ⁴*Laboratoire 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. Lee^{1,2}, and S. Takeuchi^{1,2}
¹*University of Tokyo, JAPAN* and ²*Japan Science and Technology Agency (JST), JAPAN*

Novel/Smart/Responsive Materials**M.029b****BIOCOMPATIBILITY OF OSTE POLYMERS STUDIED BY CELL GROWTH EXPERIMENTS**

C. Errando-Herranz^{1,2}, A. Vastesson^{1,3}, M. Zelenina¹, G. Pardon¹, G. Bergström³, W. van der Wijngaart¹,
T. Haraldsson¹, H. Brismar¹, and K.B. Gylfason¹
¹*Royal Institute of Technology (KTH), SWEDEN*, ²*Universidad Politécnica de Valencia, SPAIN*, and
³*Linköping University, SWEDEN*

M.030b**MAGNETOPHORETIC MANIPULATION IN MICROSYSTEM USING I-PDMS MICROSTRUCTURES**

R. Gelszinnis, M. Faivre, J. Degouttes, N. Terrier, R. Ferrigno, and A.-L. Deman
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

M.032b**SYNTHESIS OF JANUS MICROHYDROGELS WITH ANISOTROPIC THERMO-RESPONSIVENESS AND ORGANOPHILIC/HYDROPHILIC LOADING CAPABILITY**

K.D. Seo, J. Doh, D. Choi, M. La, and D.S. Kim
Pohang University of Science and Technology (POSTECH), SOUTH KOREA

Surface Modification**M.033b****LOCAL SURFACE MODIFICATION AT THE MICROSCALE ENABLED BY LIQUID DIELECTROPHORESIS TECHNOLOGY**

R. Renaudot¹, T. Nguyen¹, Y. Fouillet¹, L. Jalabert², M. Kumemura², D. Collard², H. Fujita², and V. Agache¹
¹*Commissariat à l'énergie atomique (CEA), FRANCE* and ²*University 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. Yokokawa^{1,2}
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. Klamchuen^{1,3}, M. Gang¹, H. Yong¹, F. Zhuge¹, N. Kaji², Y. Baba^{2,4}, 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 NANOPARTICLE 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. Lee^{1,2}, J. Park³, K. Kim^{4,5}, A. Zettl^{4,5}, D.A. Weitz³, and S. Takeuchi^{1,2}
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 MICROFLUIDICS 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. Viefhues¹, J. Regtmeier¹, R. Eichhorn^{2,3}, 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. Rühle
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 SIMULTANEOUS ASSEMBLY OF SERS NANOPARTICLES AND BIOMOLECULES FOR RAPID BIO-DETECTION

C.W. Lee¹ and F.-G. Tseng^{1,2}
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

J.H. Lee¹, J.H. Rho², K.S. Shin², D.S. Lee², J.A. Lee³, S.Y. Kim⁴, and Y.H. Cho^{1,5}
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. Prins^{1,2}
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 NANO HOLE 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. Yamamoto², 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. Tseng^{1,2}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. Nguyen^{1,2}, M. Chikae¹, Y. Ukita¹, and Y. Takamura¹¹Japan 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**

H.C. Hao, M.C. Chiang, S.C. Liu, C.Y. Hsiao, C.M. Yang, K.T. Tang, and D.J. Yao

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. Wu²¹Shanghai 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 PHENOTYPE 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. Bourouina³¹Nanyang Technological University, SINGAPORE, ²DSO National Laboratories, SINGAPORE, and ³University of Paris Est, FRANCE

M.070c**DEVELOPMENT OF NOVEL MICRO OPTICAL DIFFUSION SENSOR USING COMB-DRIVEN MICRO FRESNEL MIRROR**

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

M.071c**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

M.072c**MAGNETO-OPTICAL DETECTION OF MAGNETIC NANOBeadS IN A MICROFLUIDIC CHANNEL**

M. Donolato^{1,2}, P. Vavassori³, and M.F. Hansen²
¹*CIC nanoGUNE, SPAIN*, ²*Danmarks Tekniske Universitet (DTU), DENMARK*, and ³*IKERBASQUE, SPAIN*

M.073c**OPTICAL SENSING AND ANALYSIS SYSTEM BASED ON POROUS LAYERS**

A. Kovacs¹, A. Malisaukaite¹, A. Ivanov¹, U. Mescheder¹, and R. Wittig²
¹*Furtwangen University, GERMANY* and ²*University Ulm, GERMANY*

Mass Spectrometric Detection**M.074c****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)****M.075d****A DISPOSABLE CHIP ENABLING METERING IN DRIED BLOOD SPOT SAMPLING**

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

M.076d**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

M.077d**FAST PROTOTYPING OF PAPER-BASED MICROFLUIDIC BY CONTACT STAMPING**

V.F. Curto¹, N. Lopez-Ruiz², L.F. Capitan-Vallvey², A.J. Palma², F. Benito-Lopez³, and D. Diamond¹
¹*Dublin City University, IRELAND*, ²*University of Granada, SPAIN*, and ³*CIC microGUNE, SPAIN*

M.078d**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. Beyer^{1,2}, and D. Trau¹

¹*National University of Singapore, SINGAPORE and*

²*Singapore-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. Land^{1,2}, M.M. Mbanjwa², and J.G. Korvink²

¹*Council for Scientific and Industrial Research (CSIR), SOUTH AFRICA and* ²*University 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. Onoe^{1,2}, M. Takinoue³, and S. Takeuchi^{1,2}

¹*University of Tokyo, JAPAN,* ²*Japan Science and Technology Agency (JST), JAPAN, and*

³*Tokyo 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. Ducreé

Dublin City University, IRELAND

M.088d**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
¹*Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY*, ²*Universitätsklinikum Freiburg, GERMANY*, and ³*University of Freiburg - IMTEK, GERMANY*

M.089d**OLED-INDUCED FLUORESCENCE DETECTION SYSTEM FOR COMPACT DISK-TYPE MICROFLUIDIC DEVICE**

K. Morioka¹, A. Hemmi², H. Zeng¹, K. Uchiyama¹, and H. Nakajima¹
¹*Tokyo Metropolitan University, JAPAN* and ²*Mebius Advanced Technology Ltd., JAPAN*

Electrokinetic Microfluidics**M.090d****MICROFLUIDIC FREE-FLOW ELECTROPHORETIC SEPARATION OF PROTEINS USING ELECTRICALLY SWITCHABLE PH ACTUATORS AND 3D EMBEDDED SALT BRIDGES**

L.J. Cheng
Oregon State University, USA

Other & Novel Microfluidic Platforms**M.091d****A SELF-CONTAINED, USER-FRIENDLY, PROGRAMMABLE CELL STIMULATION PLATFORM**

A.K. Au¹, S. Gibbs¹, A. Scott¹, L.F. Horowitz¹, E. Vinckenbosch^{1,2}, B. Otis¹, and A. Folch¹
¹*University of Washington, USA* and ²*École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND*

M.092d**DEVELOPMENT OF MICROFLUIDIC DEVICE WITH MOVABLE ELECTRODE FOR ELECTRICAL IMPEDANCE MEASUREMENT ON THE ACTIVELY COMPRESSED SINGLE CELL**

J.Y. Kim^{1,2} and Y.E. Yoo^{1,2}
¹*Korea Institute of Machinery & Materials (KIMM), SOUTH KOREA* and
²*University of Science & Technology, SOUTH KOREA*

M.093d**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

M.094d**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

M.095d**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

M.096d**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. Attayek^{1,2}, Y. Wang¹, B.G. Vincent¹, P.M. Armistead¹, C.E. Sims¹, and N.L. Allbritton^{1, 2}

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

M.101e

SHALLOW ANTIBODY-COATED MICROCHANNEL BASED SELECTIVE CELL CAPTURE AND ANALYSIS

Y. Tanaka¹, K. Jang², J. Wakabayashi², R. Ishii³, K. Sato³, K. Mawatari², 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. Lee^{1,2}, 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. Nakashima¹, R. Monji², K. Sato³, and K. Minami²¹Kumamoto 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. Khamenehfar¹, Y. Chen¹, D.E. Hogge², and P.C.H. Li¹¹Simon Fraser University, CANADA and ²BC Cancer Agency, CANADA**M.109e****MULTIPARAMETER HIGH-THROUGHPUT MECHANICAL PHENOTYPING**M. Masaeli^{1,2}, H.T.K. Tse^{1,2,3}, D.R. Gossett^{1,2,3}, D. Gupta^{1,2}, and D. Di Carlo^{1,2}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^{1,2}, R. Trouillon¹, J. Dunevall², and A.G. Ewing^{1,2}²University of Gothenburg, SWEDEN and ¹Chalmers 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**

M.L. Rexius, Z. Wang, S.C. Oppgaard, J. Cheng, J. Rehman, and D.T. Eddington

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. Abe^{1,3}, K. Kamiya¹, T. Osaki^{1,2}, R. Kawano¹, K. Akiyoshi⁴, N. Miki^{1,3}, and S. Takeuchi^{1,2}

¹*Kanagawa Academy of Science and Technology, JAPAN*, ²*University of Tokyo, JAPAN*, ³*Keio University, JAPAN*, and

⁴*Kyoto 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. Okitsu^{1,2}, H. Onoe^{1,2}, M. Kiyosawa², H. Teramae³, S. Iwanaga², S. Miura², T. Kazama⁴, T. Matsumoto⁴, and S. Takeuchi^{1,2}

¹*University of Tokyo, JAPAN*, ²*Japan Science and Technology Agency (JST), JAPAN*, ³*Shumei University, JAPAN*, and

⁴*Nihon 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

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

M.120e

GEOMETRIC CONTROL AND CHEMICAL RESPONSE OF CELLULAR CLUSTERS USING FREE-STANDING MESHED 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

¹*Tokyo Denki University, JAPAN* and ²*Shibaura Institute of Technology, JAPAN*

M.122e

ON-CHIP TRAPPING AND VIABILITY ASSESSMENT OF SUBMICROLITER PRIMARY TISSUES FOR PERSONALIZED TREATMENT OF OVARIAN CANCER

M. Astolfi^{1,3,4}, S. Fartoumi¹, S. Kataria⁵, M.-H. Faille¹, W. Sanger¹, O. Morin¹, B. Péant^{3,4}, J. Kendall-Dupont^{3,4}, D. Provencher^{2,3,4}, A.-M. Mes-Masson^{2,3,4}, and T. Gervais¹

¹*Polytechnique Montréal, CANADA*, ²*Université de Montréal, CANADA*, ³*Centre hospitalier de l'Université de Montréal, CANADA*, ⁴*Institut du cancer de Montréal, CANADA*, and ⁵*Indian Institute of Technology Delhi, INDIA*

M.123e

STRETCHABLE PROTEIN-BASED GELS FOR 2.5 D AND 3D MECHANOTRANSDUCTION STUDIES

C.S. Simmons^{1,2}, M.A. Burkhardt³, V. Vogel³, and B.L. Pruitt¹

¹*Stanford University, USA*, ²*University of Florida, USA*, and ³*ETH 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. Joo², and S. Chung¹
¹*Korea University, SOUTH KOREA* and ²*Korea 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

T. Hirose, Y. Hoshino, D.H. Yoon, T. Mori, T. Sekiguchi, H. Takeyama, and S. Shoji
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. Li², D.Y. Wang², H.M. Xia¹, and Z.P. Wang¹
¹*Singapore Institute of Manufacturing Technology, SINGAPORE* and ²*National 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. Miura^{1,2}, T. Teshima¹, F. Tomoike¹, and S. Takeuchi^{1,2}
¹*University of Tokyo, JAPAN* and ²*Japan 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

M.J. Jebrail, S. Vellucci, A. Sinha, R.F. Renzi, S.S. Branada, and K.D. Patel
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*microfluidic 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. Götzen², F. Scherag¹, G. Sulz³, M. Schmidt⁴, M. Panning¹, H. Attig⁵, T. Brandstetter², and J. Rühle²

¹*University of Freiburg, GERMANY,* ²*microTEC 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. Nilsson², L.K. Nyberg¹, C. Noble², L. Svensson Stadler³, E.R.B. Moore³, T. Ambjörnsson², J. Tegenfeldt², and F. Westerlund¹

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. Yanagida², M. Kanai², K. Nagashima², T. Kawai², and Y. Baba^{1,3}

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. Kaihatsu², 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. Yarnell², E.L. Pearson², C.M. Oleksak², A.T. Fischer², R.P. Luoma², J.M. Robinson², and A.R. Wheeler¹

¹*University of Toronto, CANADA and* ²*Abbott Diagnostics, USA*

M.146g

AUTOMATIC PH CHANGING SYSTEM FOR SENSITIVITY IMPROVEMENT OF ELISA ON LAB-ON-PAPER

A. Apilux^{1,2,3}, Y. Ukita¹, M. Chikae¹, O. Chailapakul³, and Y. Takamura¹

¹*Japan Advanced Institute of Science and Technology, JAPAN,* ²*Mahidol University, THAILAND, and*

³*Chulalongkorn University, THAILAND*

M.147g

SINGLE-STEP ENZYME 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. Geiger¹, V. Hummel³, A. Normann³, A. Haage³, G. Link¹, D. Maier¹, N. Schneiderhan-Marra¹, and M. Stelzle¹

¹*NMI Natural and Medical Sciences Institute, GERMANY,* ²*Microfluidic ChipShop GmbH, GERMANY, and*

³*Mediagnost 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. Tai², W.-Y. Luo¹, T.-S. Yeh³, and G.-B. Lee¹
¹*National Tsing Hua University, TAIWAN*, ²*National Cheng Kung University, TAIWAN*, and
³*Chang 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
¹*University of Leeds, UK* and ²*St. 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
¹*University of Maryland, College Park, USA*, ²*National Institute of Standards and Technology, USA*, and
³*Children's National Medical Center, USA*

M.157h

TOWARDS AN IMPLANTABLE PULSED MODE ELECTROLYTIC DRUG DELIVERY SYSTEM

Y. Yi, U. Buttner, 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. Iwanaga^{1,2}, Y. Morimoto¹, and S. Takeuchi^{1,2}

¹*University of Tokyo, JAPAN* and ²*Japan 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. Kosteljik², C.B. Lambalk², and S. Le Gac¹

¹*MESA+, University of Twente, THE NETHERLANDS* and ²*VU 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. DeWeerth^{1,4}

¹*Georgia Institute of Technology, USA*, ²*Axion BioSystems, Inc., USA*, ³*Massachusetts Institute of Technology, USA*, and ⁴*Emory 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

¹*Korea University, SOUTH KOREA* and ²*Yonsei 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. Choi^{1,3}, Y.-G. Jung², E.K. Kim^{1,2,3}, M. Lee², J. Yoo², and S. Kwon¹

¹*Seoul National University, SOUTH KOREA*, ²*QuantaMatrix Inc., SOUTH KOREA*, and

³*Inter-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. Harrison^{1,2}

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. Shih², 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. Tseng^{1,3}

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. Pihosh^{1,2}, Y. Kajita¹, K. Mawatari^{1,2}, and T. Kitamori^{1,2}

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. Onoe^{1,2}, and S. Takeuchi^{1,2}

¹University of Tokyo, JAPAN and ²Japan Science and Technology Agency (JST), JAPAN

M.187l

IN-AIR OPEABLE 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

Food & Nutrition

M.1901

AUTOMATIC FOOD-PATHOGEN DETECTION ON A CENTRIFUGAL MICROFLUIDIC CARTRIDGE IN A COMMERCIALY AVAILABLE PCR THERMOCYCLER

M.C. Weil¹, W. Hauser², D. Kosse¹, O. Strohmeier^{1,3}, F. von Stetten^{1,3}, R. Zengerle^{1,3}, and D. Mark¹

¹*Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY,*

²*Institut für Produktqualität, GERMANY, and* ³*University of Freiburg - IMTEK, GERMANY*

16:00 - 16:30 **Break and Exhibit Inspection**

16:30 - 17:15 **Plenary Presentation III**

THE BLOSS 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. Takinoue^{1,3}

¹*Tokyo Institute of Technology, JAPAN,* ²*University of Tokyo, JAPAN, and*

³*Japan 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

¹*University of Cincinnati, USA and* ²*Saint 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

¹*Seoul National University, SOUTH KOREA and* ²*Kyung 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

¹*National Tsing Hua University, TAIWAN and* ²*Taipei 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 (μ SIP)

J. Liu^{1,2}, D. Mitra¹, J.R. Waldeisen¹, R.H. Henrikson¹, Y. Park¹, S. Li², and L.P. Lee¹

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. Xu¹, M.R. Begley², and J.P. Landers¹

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. Kwak^{1,2}, V.S. Pham¹, B.J. Kim¹, L. Chen³, and J. Han^{1,3}
¹*Massachusetts Institute of Technology, USA*, ²*Korea Institute of Science and Technology (KIST), SOUTH KOREA*,
³*Singapore-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
Z.D. Harms, D.G. Haywood, A.R. Kneller, L. Selzer, A. Zlotnick, and S.C. Jacobson
Indiana University, USA

Session 2B1 - Biomolecular Detection 1

09:45 - 10:05
MEGAHERTZ-GENERATED FEMTOLITER MICROFLUIDIC DROPLETS FOR SINGLE-MOLECULE-COUNTING IMMUNOASSAYS
J.-U. Shim^{1,2,3}, R.T. Ranasinghe², F. Hollfelder², W.T.S. Huck⁴, D. Klenerman², C. Abell², and J. Cooper³
¹*University of Leeds, UK*, ²*University of Cambridge, UK*, ³*University of Glasgow, UK*, and
⁴*Radboud 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
T.H.H. Le, K. Mawatari, H. Shimizu, T. Yatsui, T. Kawazoe, M. Naruse, M. Ohtsu, and T. Kitamori
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, and², A. Hajimiri¹
¹*California Institute of Technology, USA* and ²*Georgia 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

10:25 - 10:45

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

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

Session 2A2 - Particle Manufacturing and Encoding

11:15 - 11:35

COMPLEX 3D SHAPED PARTICLE FABRICATION VIA INERTIAL FLOW DEFORMATION AND UV POLYMERIZATION

A.J. Chung^{1,2}, 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

J. Lee, P.W. Bisso, R.L. Srinivas, J.J. Kim, A.J. Swiston, and P.S. Doyle

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. Emaminejad^{1,2}, 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 Ceremony**

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 (K_D) 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

¹*University of Utah, USA* and ²*Wayne State University, USA*

T.006a

HIGH THROUGHPUT NANODROPLET GENERATION BY USING SPONTANEOUS EMULSIFICATION

M. Fukuyama^{1,2}, and A. Hibara²

¹*University of Tokyo, JAPAN* and ²*Tokyo 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

T.009a**SIMPLE GENE TESTING METHOD USING AN AUTOMATED NUCLEIC ACID PURIFICATION DEVICE AND A MICRO CHAMBER ARRAY**

A. Yamaguchi^{1,2}, F. Takagi¹, K. Kobayashi², T. Honda³, and Y. Saito¹

¹Seiko Epson Corporation, JAPAN, ²Shinshu University, JAPAN, and ³Shinshu University Hospital, JAPAN

T.010a**WIDE RANGE DYNAMIC VOLUME RATIO AND SIZE CONTROL OF MICRODROPLETS USING ACTIVE DROPLET DIVISION DEVICE**

J. Ito, D.H. Yoon, T. Sekiguchi, and S. Shoji

Waseda University, JAPAN

Optofluidics**T.011a****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

T.012a**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

T.013a**SINGLE-LAYER MICROFLUIDIC "DISC" DIODES VIA OPTOFLUIDIC LITHOGRAPHY FOR ULTRA-LOW REYNOLDS NUMBER APPLICATIONS**

R.D. Sochol, C.J. Deeble, V. Shen, M. Nakamura, B.J. Hightower, T.A. Brubaker, K.Y. Lee, S. Gao, M. Kim, K.T. Wolf, K. Iwai, C.C. Glick, L.P. Lee, and L. Lin

University of California, Berkeley, USA

Magnetofluidics (Magnetic Particles & Related Phenomena)**T.014a****ON-CHIP FORMATION AND FUSION OF SPHEROIDS BY LABEL-FREE MAGNETIC CELL MANIPULATION**

N. Sho, K. Morishima, and Y. Akiyama

Osaka University, JAPAN

Acoustic Phenomena (BULK & Surface Based)**T.015a****DECOUPLING OF ACOUSTIC AND FLUIDIC BOUNDARIES IN ACOUSTOPHORESIS**

I. Leibacher, S. Schatzer, and J. Dual

ETH Zürich, SWITZERLAND

Nanofluidic Phenomena (Nanochannels, -Tubes & -Pores)**T.016a****DEVELOPMENT OF HEAT-DRIVEN NANOFLUIDIC PUMP**

Y. Hiramatsu¹, C. Wang^{1,2}, H. Shimizu^{1,2}, K. Mawatari^{1,2}, and T. Kitamori^{1,2}

¹University of Tokyo, JAPAN and ²Japan Science and Technology Agency (JST), JAPAN

T.017a**PRESSURE-ASSISTED SELECTIVE ELECTROPRECONCENTRATION IN A STRAIGHT NANOCHANNEL**

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 NANOFUIDIC 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 BRANCHED H-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. Wang^{1,2}, 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. Matthys, 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, R. Ohashi¹, H. Honma¹, N. Misawa¹, K. Takahashi¹, K. Sawada¹, M. Ishida¹, and Y. Murakami^{1,2}

¹Toyohashi 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. Tofteberg, 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

V. Krivitsky, L.C. Hsiung, V. Naddaka, Y.K. Conroy, L. Burstein, H. Peretz-Soroka, and F. Patolsky
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 MICROTUBULES MOTILITY USING ELECTRICAL FIELD ON KINESIN/DYNEIN COATED SURFACES

N.K. Kamisetty¹, J. Ikuta¹, H. Shintaku¹, H. Kotera¹, and R. Yokokawa^{1,2}
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

Y. Ueno, K. Furukawa, K. Matsuo, S. Inoue, K. Hayashi, H. Hibino, and Y. Sato
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. Baba^{1,3}
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. Bardin^{1,2}, 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. Goldschmidtboing, 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. Shannon¹

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-López¹

ICIC 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

T.046c**ULTRA DIELECTROPHORESIS: ELECTROTHERMAL ANALYSIS AND ITS APPLICATIONS IN MICROFLUIDIC SAMPLE PREPARATION AND PROTEOMICS**

S. Emaminejad, M. Javanmard, C. Gupta, R.W. Dutton, R.W. Davis, and R.T. Howe
Stanford University, USA

T.047c**APTAMER-FUNCTIONALIZED MICROTUBULE 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

T.048c**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

T.049c**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

T.050c**FABRICATION OF INTEGRATED MICROPATTERN SENSOR CHIP FOR ANALYSIS OF CELL ADHESION DYNAMICS**

C.-H. Lee, N. Matsui, and M. Takai

University of Tokyo, JAPAN

T.051c**KINETIC AND THERMODYNAMIC ANALYSES OF DNA HYBRIDIZATION REVEAL THE MECHANISM OF GOLD NANOPARTICLE-ASSISTED SINGLE BASE-PAIR DISCRIMINATION IN THE NANOBIOARRAY CHIP**

A. Sedighi and P.C.H. Li

Simon Fraser University, CANADA

T.052c**METABOLITE ANALYTICS WITH AN INTEGRATED PROTEIN SENSOR ON A MICROFLUIDIC CHIP**

S. Ketterer, D. Hoevermann, W. Weber, and M. Meier

University of Freiburg, GERMANY

T.053c**MULTI-MARKER SCREENING USING NODE-PORE SENSING**

K.R. Balakrishnan and L.L. Sohn

University of California, Berkeley, USA

T.054c**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

T.055c**RAPID AIRBORNE PATHOGENS DETECTION SYSTEM USING DISPOSABLE IMPACTION CARTRIDGE**

K. Takenaka¹, S. Togashi¹, and R. Miyake²

¹Hitachi, Ltd., JAPAN and ²University of Tokyo, JAPAN

T.056c**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. Zandoni¹, 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-Narváez^{1,2}, and A. Merkoçi^{1,3}

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

T.062c**POLYMERIZATION OF BIOLOGICAL MOLECULES IN A MICROCHANNEL GENERATES BOTH HIGH AND LOW-REFRACTIVE INDEX INGREDIENTS**

K. Hayashi, S. Inoue, T. Horiuchi, Y. Iwasaki, N. Matsuura, and Y. Sato

Nippon Telegraph and Telephone Corporation, JAPAN

T.063c**USB-TYPE POINT-OF-CARE SENSOR FOR STRIPPING ANALYSIS OF TRACE METALS**

W. Kang¹, X. Pei¹, A. Bange², E. Haynes¹, W.R. Heineman¹, and I. Papautsky¹

¹University of Cincinnati, USA and ²Xavier University, USA

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. Asano¹, H. Shimizu^{1,2}, K. Mawatari^{1,2}, and T. Kitamori^{1,2}
¹*University of Tokyo, JAPAN* and 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. Tonooka¹, K. Sato¹, R. Kawano², T. Osaki^{1,2}, and S. Takeuchi^{1,2}
¹*University of Tokyo, JAPAN* and *Kanagawa Academy of Science and Technology (KAST), JAPAN*

T.070c

MICRO/NANO SURFACE TENSION MEASUREMENT BY 2D-CAPILLARY WAVE RESONANCE

M. Chung^{1,2}, C. Pigot³, and A. Hibara²
¹*University of Tokyo, JAPAN*, ²*Tokyo Institute of Technology, JAPAN*, and 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. Fan¹, C.L. Cassano¹, and W. Liu^{1,2}
¹*University of Florida, USA* and 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

¹*University of Toronto, CANADA and* ²*Assiut 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

¹*Chungnam National University, SOUTH KOREA and* ²*Korea Institute of Science and Technology (KIST), SOUTH KOREA*

T.080d

ELECTROSTATIC POTENTIAL WELLS FOR MANIPULATIONS OF DROPS IN MICROCHANNELS

R. de Ruiter, A.M. Pit, V. Martins de Oliveira, D. Wijnperlé, M.H.G. Duits, H.T.M. van den Ende, and F. Mugele

University of Twente, THE NETHERLANDS

T.081d

ON-DEMAND PHOTOTHERMAL PATTERNING OF PATHWAY FOR PICOLITER DROPLET

M. Muto and M. Motosuke

Tokyo University of Science, JAPAN

Centrifugal Microfluidics

T.082d

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

¹*Samsung Advanced Institute of Technology (SAIT), SOUTH KOREA and* ²*Samsung Electronics, SOUTH KOREA*

T.083d

DEVELOPMENT OF A ROTATABLE REAGENT CARTRIDGE FOR HIGH-PERFORMANCE MICROVALVE SYSTEM ON A CENTRIFUGAL MICROFLUIDIC DEVICE

T. Kawai, N. Naruishi, H. Nagai, Y. Tanaka, Y. Hagihara, and Y. Yoshida

National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

T.084d

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. Ducreé

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 Stetten^{1,2}, R. Zengerle^{1,2,3}, and N. Paust^{1,2}

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

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

¹*Osaka University, JAPAN* and ²*Nagoya 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

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

B.H. Ha, K.S. Lee, J.H. Jung, G. Destgeer, and H.J. Sung

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

¹*Pennsylvania State University, USA* and ²*Ascent 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. Patel², and A. Lee²

¹*Flintridge Preparatory School and USA*, ²*University 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

Y.-H. Yu, I.-F. Yu, J. Yu, and J.-T. Yang

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

¹*Seoul National University, SOUTH KOREA* and ²*National 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. Sollier^{1,2}, D.E. Go^{1,2}, N. Kummer³, M. Rettig³, J. Goldman³, N. Nickols³, S. McCloskey³, R.P. Kulkarni³, and D. Di Carlo¹

¹*University of California, Los Angeles, USA*, ²*Vortex Biosciences, USA*, and

³*University of California, Los Angeles Medical Center, USA*

T.103e**SCREENING OF CIRCULATING TUMOR CELLS IN TUMOR-BEARING MOUSE BLOOD BY A DETERMINISTIC LATERAL DISPLACEMENT MICRO FLUIDIC DEVICE**

H. Okano, K. Suyama, S. Ariyasu, T. Suzuki, R. Abe, S. Aoki, and M. Hayase
Tokyo University of Science, JAPAN

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. Mawatari^{1,2}, and T. Kitamori^{1,2}
¹*University of Tokyo, JAPAN* and ²*Japan 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. Fröhlich², Y.-P. Ho², B.R. Knudsen², and C.N. Baroud¹
¹*Ecole Polytechnique, FRANCE* and ²*Aarhus 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. Tseng^{1,2}
¹*National Tsing Hua University, TAIWAN* and ²*Academia 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. Tsuda^{2,3}, H. Suzuki^{3,4}, and T. Tomo^{1,3}
¹*Osaka University, JAPAN*, ²*University of Glasgow, UK*, ³*Japan Science and Technology Agency (JST), JAPAN*, and ⁴*Chuo 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-Negishi^{1,2}, H. Onoe^{1,2}, S. Iwanaga^{1,2}, Y. Kobayashi³, M. Nakamura³, H. Okano³, and S. Takeuchi^{1,2}

¹*University of Tokyo, JAPAN*, ²*Japan Science and Technology Agency (JST), JAPAN* and ³*Keio 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

¹*University of Tokyo, JAPAN* and ²*Kyoto 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. Kanda^{1,2}, H. Moriguchi², R.G. Yamada², Y. Tanaka^{1,2}, and H.R. Ueda^{1,2,3}

¹*Osaka University, JAPAN*, ²*RIKEN, JAPAN*, and ³*University 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

¹*Institut Galien Paris Sud, FRANCE* and ²*CNRS, 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. Sugiura², Y. Kondo¹, T. Satoh², A. Kurisaki², M. Asashima², K. Ohnuma¹, and T. Kanamori¹

¹*Nagaoka University of Technology, JAPAN* and

²*National 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

¹*Catholic University of America, USA* and ²*University 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

¹*University of Maryland, College Park, USA* and ²*National Chung Hsing University, TAIWAN*

Others**T.125e****MULTIPARAMETRIC TUMOR CELL CULTURE MONITORING WITH A NOVEL MICROSENSOR SYSTEM**

A. Weltin¹, K. Slotwinski¹, J. Kieninger¹, I. Moser², G. Jobst², R. Ehret³, and G.A. Urban¹

¹*University of Freiburg - IMTEK, GERMANY*, ²*Jobst Technologies GmbH, GERMANY*, and ³*Bionas GmbH, GERMANY*

T.126e**ROTATION OF CELLS AND CELL CLUSTERS IN CULTURE MEDIA FOR OPTICAL COMPUTED TOMOGRAPHY**

H. Wang, M. Stanley, I.S. Elango, R.M. Shetty, W. Teller, A. Shabilla, P. Limsirichai, H. Zhu, J. Houkal, D. Smith, S.-H. Chao, L. Kelbaskas, R.H. Johnson, and D.R. Meldrum

Arizona State University, USA

Organs & Organisms**Organs on Chip****T.127f****DEVELOPMENT OF AN EX-VIVO LYMPHATIC VASCULAR MODEL**

M. Sato¹, N. Sasaki², K. Sato³, S. Hirakawa⁴, and K. Sato¹

¹*Japan Women's University, JAPAN*, ²*Toyo University, JAPAN*, ³*Gunma University, JAPAN*, and

⁴*Hamamatsu 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. Laurell^{1,3}, J. Nilsson¹, and S. Ekström¹
¹*Lund University, SWEDEN*, ²*Labmedicin Skåne, SWEDEN*, and ³*Dongguk 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. Baba^{1,3}
¹*Nagoya University, JAPAN*, ²*Osaka University, JAPAN*, and
³*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*

T.136g

BEAD-BASED MELTING ANALYSIS IN TEMPERATURE-GRADIENT MICROCHANNELS FOR SINGLE NUCLEOTIDE POLYMORPHISMS DETECTION

K.C. Li, S.T. Ding, E.C. Lin, L. Wang, and Y.W. Lu
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. Tokeshi^{1,3}, Y. Horiike⁴, and Y. Baba^{1,5}
¹*Nagoya University, JAPAN*, ²*Stockholm University, SWEDEN*, ³*Hokkaido University, JAPAN*, and
⁴*National Institute for Materials Science, JAPAN*, and
⁵*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*

T.138g

MULTIPLEX LIGATION-DEPENDENT PROBE AMPLIFICATION (MLPA) ON-CHIP

S. Peeters¹, B. Jones¹, O. Ibrahim^{1,3}, R. Wiederkehr¹, L. Zhang¹, H. Tanaka⁴, T. Matsuno⁴, I. Yamashita⁴,
B. Majeed¹, T. Stakenborg¹, P. Fiorini¹, and L. Lagae¹
¹*IMEC, BELGIUM*, ²*Alexandria University, EGYPT*, ³*Centre of Excellence for Nano-manufacturing Applications (CENA), SAUDI ARABIA*, and ⁴*Panasonic 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. Opatthalage, M. Ludwig, and S. Fraden
Brandeis University, USA

T.142g

MULTIPLEX ANALYSIS OF CARBOHYDRATE/PROTEIN COMPLEX FOR NEUROBLASTOMA CELLS

F. Pastorino² and G. Simone¹
²*Istituto G. Gaslini, ITALY* and ¹*University 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. Ahn^{1,2}
¹*Siloam Biosciences, USA* and ²*University 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. Lehr^{1,2}, and M.A.M. Gijss¹
¹*École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND,*
²*Universitaire Vaudois (CHUV), SWITZERLAND, and* ³*Université de Lausanne, SWITZERLAND*

T.145g

SINGLE-STEP, MULTI-PARAMETER MONITORING OF LIVER FUNCTION ON A PORTABLE CENTRIFUGAL ANALYZER

C.E. Nwankire, M. Czugała, 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. Yildirim^{2,3}, S.J. Trietsch^{2,4}, T. Hankemeier², M.D. Tarn¹, N. Pamme¹, and P. Vulto^{2,4}
¹*University of Hull, UK,* ²*University of Leiden, THE NETHERLANDS,* ³*Cankaya University, TURKEY, and* ⁴*MIMETAS VB, THE NETHERLANDS*

Medical Research & Applications

Cancer Research

T.148h

CIRCULATING TUMOR CELL (CTC) ENRICHMENT: ULTRA HIGH THROUGHPUT PROCESSING OF CLINICALLY RELEVANT BLOOD VOLUMES USING A MULTIPLEXED SPIRAL BIOCHIP

M.E. Warkiani¹, B.L. Khoo², D.S.W. Tan³, A.S. Bhagat⁴, W.T. Lim³, J. Han⁵, and C.T. Lim²

¹*Singapore-MIT Alliance for Research and Technology (SMART), SINGAPORE,*

²*National University of Singapore, SINGAPORE,* ³*National Cancer Centre Singapore, SINGAPORE,*

⁴*ClearbridgeBioMedics Pte Ltd., SINGAPORE,* and ⁵*Massachusetts Institute of Technology, USA*

T.149h

MICROFLUIDIC LIPOSOMES TARGETING HYPOXIA INDUCED TUMOR PROGRESSION

A.U. Andar¹, R.R. Hood¹, W.N. Vreeland², A. Yang¹, P. Shapiro¹, D.L. DeVoe¹, and P.W. Swaan¹

¹*University of Maryland, Baltimore, USA* and ²*National Institute of Standards and Technology (NIST), USA*

T.150h

REAL TIME BIO MECHANICAL CHARACTERIZATION OF DNA DAMAGE UNDER THERAPEUTIC RADIATION BEAMS

G. Perret^{3,4}, T. Lacornerie², M. Kumemura^{1,4}, N. Lafitte^{1,4}, H. Guillou¹, L. Jalabert¹, E. Lartigau², T. Fujii^{1,4}, F. Cleri³, H. Fujita^{1,4}, and D. Collard^{1,4}

¹*LIMMS-CNRS-IIS, JAPAN,* ²*University of Lille 2, FRANCE,* ³*University of Lille 1, FRANCE,* and

⁴*University of Tokyo, JAPAN,*

Personalized Medicine

T.151h

DEVELOPMENT OF 3RD GENERATION IMMUNO-PILLAR DEVICE FOR HIGH SENSITIVE DETECTION OF DISEASE MARKERS

N. Nishiwaki¹, T. Kasama², A. Ishida¹, H. Tani¹, Y. Baba^{2,3}, and M. Tokeshi^{1,2}

¹*Hokkaido University, JAPAN,* ²*Nagoya University, JAPAN,* ³*The Priority Research Project, JAPAN*

T.152h

TOWARDS PERSONALIZED MENTAL HEALTHCARE: AN ELECTROCHEMICALLY-AMPLIFIED BIOSENSOR FOR CLOZAPINE ANTIPSYCHOTIC TREATMENT MONITORING

H. Ben-Yoav¹, T.E. Winkler¹, S.E. Chocron¹, G.R. Costa¹, S.M. Restaino¹, N. Woolsey¹, E. Kim¹, D.L. Kelly², G.P. Payne¹, and R. Ghodssi¹

¹*University of Maryland, College Park, USA* and ²*University of Maryland School of Medicine, USA*

Drug Delivery Systems

T.153h

HIGH THROUGHPUT PURIFICATION DEVICES FOR *IN VIVO* APPLICATIONS OF GENE-DELIVERY MULTIFUNCTIONAL ENVELOPE-TYPE NANODEVICES

N. Kaji¹, D. Shigenaka¹, M. Ukawa², M. Tokeshi², H. Akita², H. Harashima², and Y. Baba^{1,3}

¹*Nagoya University, JAPAN,* ²*Hokkaido University, JAPAN,* and

³*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN*

T.154h

MULTIPHASE-LADEN GAS-LIQUID INTERFACE INJECTION FOR THE VERSATILE GENE TRANSFER

H. Kuriki¹, S. Takasawa², M. Iwabuchi¹, K. Ohsumi¹, T. Suzuki¹, T. Higashiyama¹, S. Sakuma³, F. Arai¹, and Y. Yamanishi²

¹*Nagoya University, JAPAN,* ²*Shibaura Institute of Technology, JAPAN,* and ³*Osaka University, JAPAN*

Regenerative Medicine & Tissue Engineering

T.155h

CONTINUOUS MANUFACTURING OF ROBUST LIVING FIBERS THAT WITHSTAND COMMON TEXTILE PROCESSING FOR TISSUE ENGINEERING APPLICATIONS

M. Akbari^{1,2,3}, A. Tamayo^{1,2,3}, V. Laforte¹, N. Annabi^{2,3}, A. Khademhosseini^{2,3}, and D. Juncker¹

¹*McGill University, CANADA,* ²*Harvard-MIT Division of Health Sciences and Technology, USA,* and

³*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. Kageyama^{1,2}, T. Kakegawa^{1,2}, T. Osaki^{1,2}, 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. Sueyoshi², 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. Harrison^{1,2}

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. Yanagida², M. Kanai², N. Kaji¹, M. Tokeshi³, K. Nagashima¹, T. Kawai¹, and Y. Baba^{1,4}
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. Joswiak^{1,2}, 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. Zhang^{1,2}, P. Fiorini¹, B. Majeed¹, L. Lagae^{1,2}, C. Van Hoof^{1,2}, 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. Shah^{1,2}, A. Saucedo², and R.M. van Dam²
¹Sofie Biosciences, USA and ²University of California, Los Angeles, USA

T.174j**REACTION CONTROL BY STIRRING-INDUCED, DISCRETE, RECURSIVE FUSION AND DIVISION OF FEMTOLITER COMPARTMENTS IN EMULSION**T. Ichii¹, G. Tanahashi², H. Suzuki^{1,3}, and T. Yomo^{1,3}¹Japan Science and Technology Agency (JST), JAPAN, ²Osaka University, JAPAN, and ³Chuo University, JAPAN**Filtering & Separation****T.175j****GUIDING OF LIQUIDS VIA PATTERNED SURFACE COATINGS TO FACILITATE SOLID-PHASE EXTRACTION IN TWO-PHASE FLOW**

M. Rendl, T. Brandstetter, J. Rühle

University of Freiburg - IMTEK, GERMANY

Chemical Synthesis**T.176j****CELL-FREE PROTEIN SYNTHESIS IN VERTICALLY-ORIENTED MICROREACTOR ARRAY DEVICES**

K. Jackson and Z.H. Fan

University of Florida, USA

T.177j**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. Wei³, Z.C. Liang¹, W. Wang¹, Z.J. Yang¹, and Z.H. Li¹¹Peking University, CHINA, ²Multimedia University, MALAYSIA, and³National Center for Nanoscience and Technology, CHINA**Particle Synthesis****T.178j****CENTRIFUGE-BASED STEPWISE CHEMICAL LOADING DISC FOR HIGH-THROUGHPUT GOLD NANOPARTICLE SYNTHESIS**

B.H. Park, J.H. Jung, S.J. Oh, D.C. Lee, and T.S. Seo

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

T.179j**MICROFLUIDIC PREPARATION OF BIOCATALYTIC PROTEIN MICROSPHERES UTILISING ON-CHIP CROSS-LINKING METHOD**M.B. Mbanjwa¹, H. Chen², and K. Land¹¹Council for Scientific and Industrial Research (CSIR), SOUTH AFRICA and²University of the Witwatersrand, SOUTH AFRICA**Applications to Green & Environmental Technologies****Fuel Cells****T.180k****PAPER-BASED MICROFLUIDIC FUEL CELLS**J.P. Esquivel¹, F.J. del Campo¹, J.L. Gómez de la Fuente³, S. Rojas³, and N. Sabaté¹¹IMB-CNM (CSIC), SPAIN and ²University of Washington, USA, ³ICP (CSIC), SPAIN**Other Energy/Power Devices****T.181k****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

T.182k**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****T.183l****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**T.184l****CIRCULAR HYDROGEL PATTERN FOR CELL ALIGNMENT UNDER UNIFORM STRAIN STIMULATION**

H.Y. Hsieh^{1,2,3}, T.W. Huang², G. Camci-Unal^{3,4}, F.G. Tseng^{2,5}, S.K. Fan¹, and A. Khademhosseini^{3,4,6}
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

T.185l**STUDY OF MOLECULAR TRANSPORT THROUGH SPECIFIC LIQUID IN BIO-MIMETIC EXTENDED NANOSPACES**

Y. Kazoe, L. Li, H. Chinen, H. Kizoe, T. Saruko, T. Yamashita, K. Mawatari, and T. Kitamori
 University of Tokyo, JAPAN

Bioprocess Technology**T.186l****DROPLET BASED DIRECTED EVOLUTION OF YEAST CELL FACTORIES DOUBLES PRODUCTION OF INDUSTRIAL ENZYMES**

S.L. Sjostrom¹, Y. Bai¹, M. Huang², J. Nielsen^{1,2,3}, H.N. Joensson¹, and H. Andersson Svahn¹
¹Royal Institute of Technology (KTH), SWEDEN, ²Chalmers University of Technology, SWEDEN, and
³Technical University of Denmark, DENMARK

T.187l**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**T.188l****CENTRIFUGAL LABTUBE FOR FULLY AUTOMATED DNA EXTRACTION & LAMP AMPLIFICATION BASED ON AN INTEGRATED, LOW-COST HEATING SYSTEM**

M.M. Hoehl¹, M. Weißert², N. Paust^{3,4}, R. Zengerle^{3,4}, 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 ²*National Cancer Center, SINGAPORE*

18:10 - 18:30

NON-FARADAIC ELECTROCHEMICAL DETECTION OF PATHOGENIC DNA AMPLIFIED BY TARGET DRIVEN SELF ASSEMBLY ON A CMOS PLATFORM

K. Jayant, M.R. Hartman, E.J. Rice, D. Luo, and E.C. Kan
Cornell University, USA

Session 2B3 - Immunoassays

17:30 - 17:50

SELF-ASSEMBLED MELAMINE MICROLENS ARRAYS FOR IMMUNOFLUORESCENCE 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. Hoehl^{1,2}, E. Schulte Bocholt², N. Karippai², R. Zengerle^{3,4}, 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
J.H. Jung, B.H. Park, S.J. Oh, and T.S. Seo
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 NANOFUIDIC CHANNELS
K. Frykholm¹, M. Alizadehheidari¹, L. Fornander¹, J. Fritzsche¹, J. Wigenius¹, P. Beuning², M. Modesti³, F. Persson⁴, 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. Watanabe^{1,2}, D. Fujita³, K.V. Tabata^{1,2}, L. Yamauchi¹, N. Soga¹, S.H. Kim¹, H. Suga¹, and H. Noji^{1,2}
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. Takasawa², S. Sakuma³, 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

¹*Keio University, JAPAN* and ²*Tokyo Medical University, JAPAN*

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

Session 3A2 - Single Cell Processing and Analysis 1

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. Wang^{1,2}, W. Longsine-Parker¹, C. Koo¹, J. Kim², B.J. Kim³, A. Jayaraman¹, and A. Han¹

¹*Texas A&M University, USA*, ²*Dankook University Graduate School, SOUTH KOREA*, and ³*University of Tokyo, JAPAN*

11:55 - 12:15

ELECTROACTIVE MICROWELL ARRAY FOR QUANTITATIVE MEASUREMENT OF INTRACELLULAR ATP AT THE SINGLE-CELL LEVEL

S.H. Kim^{1,2}, T. Fujii^{1,2}, and D. Fourmy³

¹*University of Tokyo, JAPAN*, ²*Japan Science and Technology Agency (JST), JAPAN*, and ³*CNRS, FRANCE*

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

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. Makulska¹, O. Cybulski¹, M. Costantini^{1,2}, W. Postek¹, M. Czekalska¹, P. Jankowski¹, **Piotr Garstecki¹**

¹*Polish Academy of Sciences, POLAND and* ²*Sapienza 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

¹*Kyoto University, JAPAN and* ²*Sony 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

¹*LTM-CNRS, FRANCE and* ²*Massachusetts 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

A. Jamshaid, D.H. Yoon, T. Sekiguchi, and S. Shoji

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. Jing^{1,2}, R. Ramji¹, M.E. Warkiani², C.T. Lim^{1,2}, J. Han^{2,3}, and C.-H. Chen^{1,4}

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. Erhardt^{1,2}, V. Nock¹, J. Kieninger², and G.A. Urban²

¹University of Canterbury, NEW ZEALAND and ²University of Freiburg, GERMANY

W.008a**PRECISE NANOLITER 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 OPTOFLUIDIC 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-Lopez^{1,3}, and D. Diamond¹

¹Dublin City University, IRELAND, ²University of Wollongong, AUSTRALIA, and ³CIC 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. Fermigier², S. Descroix¹, J.L. Viovy¹, and L. Malaquin¹

¹Institut Curie, FRANCE and ²PMMH-ESPCI, FRANCE

Acoustic Phenomena (BULK & Surface Based)**W.014a****ACOUSTIC CONTROL OF LIQUIDS IN MICROCHANNELS**

S. Deshmukh^{1,2}, P. Augustsson¹, Z. Brzozka², and T. Laurell^{1,3}

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 NANOFUIDIC 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 NANOCONSTRICTION 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. Savov¹, and R. Dekker^{1,2}

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**

S.Y. Chou, R. Peng, L. Zhou, and Q. Zhang

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

¹*Peking University, CHINA* and ²*Tianjin 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

¹*University of Southampton, UK* and ²*University of Bologna, ITALY*

W.026b**MICRO-SCALE DROPLET CONTACT METHOD BY MECHANICAL MOTION: REPRODUCIBLE AND ROBUST LIPID BILAYER FORMATION**

L.N.S. Zaleha^{1,2}, R. Kawano¹, H. Yasuga^{1,2}, K. Kamiya¹, T. Osaki^{1,3}, N. Miki^{1,2}, and S. Takeuchi^{1,3}

¹*Kanagawa Academy of Science and Technology, JAPAN*, ²*Keio University, JAPAN*, and ³*University 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

¹*Sun Yat-sen University, CHINA*, ²*Chinese Academy of Sciences, CHINA*, ³*Tsinghua University, CHINA*, and

⁴*Kuang-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

¹*Nagoya University, JAPAN*, ²*Osaka University, JAPAN*, and ³*Toyama 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. Sugiura¹, A. Maruyama², K. Ohnuma², and T. Kanamori¹

¹*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN* and

²*Nagaoka 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. Yokokawa^{1,2}

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

W.035b

FABRICATION OF PLANAR MICROFLUIDIC DEVICE FOR ARTIFICIAL DARWINIAN SELECTION TECHNOLOGY

S. Sato^{1,2}, T. Fukuda¹, T. Hirai^{1,2}, S. Ueno^{1,2}, M. Biyani^{1,2}, T. Akagi^{1,2}, and T. Ichiki^{1,2}

¹University of Tokyo, JAPAN and ²Japan Science and Technology Agency (JST), JAPAN

W.036b

PROTEIN-DNA CONJUGATE ARRAY CHIP FOR ON-CHIP DIRECTED EVOLUTION

S. Ueno^{1,2}, R. Kobayashi¹, M. Biyani^{1,2}, and T. Ichiki^{1,2}

¹University of Tokyo, JAPAN and ²Japan Science and Technology Agency (JST), JAPAN

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. Brouwer^{1,3}, J.C. Lotters^{1,4}, and R.J. Wiegerink¹

¹MESA+, University of Twente, THE NETHERLANDS, ²Finapres Medical Systems B.V., THE NETHERLANDS, ³DEMCON Advanced Mechatronics B.V., THE NETHERLANDS, and ⁴Bronkhorst High-Tech B.V., THE NETHERLANDS

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 MICROSENSOR 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. Tseng^{1,2}
¹*National Tsing Hua University, TAIWAN* and ²*Academia 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
¹*Institut de Microelectronica de Barcelona, IMB-CNM (CSIC), SPAIN* and
²*Technische 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^{1,3}, Z. Cao², Z.F. Huang¹, Z. Xu³, J.X. Fu¹, and L. Yobas²

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

J. Lee¹, S. Hwang¹, B. Choi¹, S. Choi¹, J.H. Lee², B.-G. Park², D.M. Kim¹, S.-J. Choi¹, and D.H. Kim¹

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^{1,2}, E. Zaitseva^{1,2}, S. Petersen^{1,2}, J.M. del Rio Martinez¹, M. Hoffmann¹, and J.C. Behrends¹

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. Kakita¹, H. Miyashita¹, S. Kishida¹, J.-O. Lee², and S.-S. Lee¹

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

N. Kilinc¹, O. Cakmak¹, A. Kosemen^{2,3}, E. Ermek¹, S. Ozturk², Y. Yerli², Z.Z. Ozturk², and H. Urey¹

¹Koc University, Rumelifeneri Yolu, 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. Ehgartner, S. Fellinger, P. Sulzer, and T. Mayr

Graz University of Technology, AUSTRIA

W.062c

NANOFLUIDIC CRYSTAL BASED LEAD SENSOR WITH DETECTION OF PICO-MOLAR

R. Zhang¹, J. Sang¹, J. Huang^{1,2}, W. Wang^{1,2}, M. Chu¹, Y. Wang¹, H. Li¹, H.A. Zhang^{1,2}, W. Wu^{1,2}, and Z. Li^{1,2}

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

Visualization & Imaging Technologies

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. Iles^{1,2}, 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. Sasagawa^{1,3}, S.H. Kim^{1,2}, K. Miyazawa¹, H. Takehara¹, T. Noda^{1,3}, T. Tokuda^{1,3}, R. Iino^{2,3}, H. Noji^{2,3}, and J. Ohta^{1,3}

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

W.072c

RAPID λ BACTERIOPHAGE DETECTION VIA CO-CULTURE OF HOST CELL ESCHERICHIA COLI BY DROPLET OPTOFLUIDIC SYSTEM

J.Q. Yu, W. Huang, L.K. Chin, L. Lei, Y.J. Zheng, W. Ser, and A.Q. Liu
Nanyang Technological University, SINGAPORE

Others

W.073c

CONTROLLING PARTICLE POSITION USING A NANOPORE TRAPPING METHOD

Y. Maeda, M. Tsutsui, K. Doi, S. Kawano, T. Kawai, and M. Taniguchi
Osaka University, JAPAN

Novel Functionalities in Integrated Microfluidic Platforms

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

W.074d

ENHANCEMENT OF CAPILLARY CONDENSATION IN EXTENDED NANOSPACE FOR HIGH-PERFORMANCE MICRO HEAT PIPE DEVICE

K. Kasai¹, C. Wang^{1,2}, H. Shimizu^{1,2}, Y. Kazoe^{1,2}, K. Mawatari^{1,2}, and T. Kitamori^{1,2}
¹*University of Tokyo, JAPAN* and ²*Japan Science and Technology Agency (JST), JAPAN*

W.075d

FABRICATION OF THREE-DIMENSIONAL MICROFLUIDIC CHANNELS IN A SINGLE LAYER OF CELLULOSE PAPER

X. Li and X.Y. Liu
McGill University, CANADA

W.076d

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

W.077d

A MICROFLUIDIC BASED FUNCTIONAL HIGH THROUGHPUT SCREEN TO DEVELOP 'PATHOGENICITY LANDSCAPES' OF INDWELLING DEVICE-RELATED PATHOGENS

W.M. Weaver, V. Milisavljevic, R. Damoiseaux, J.F. Miller, and D. Di Carlo
University of California, Los Angeles, USA

Digital Microfluidics on Surfaces

W.078d

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

W.079d

PLANARIZATION OF THE SURFACE OF ELECTROWETTING ON DIELECTRIC DEVICE FOR DROPLET SPEED IMPROVEMENT

C. Lee¹, H.C. Kim¹, and H. Chun²
¹*Seoul National University, SOUTH KOREA* and ²*Korea 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. Schwarz¹, N. Paust¹, S. Zehnle¹, F. von Stetten^{1,2}, R. Zengele^{1,2,3}, and D. Mark¹
¹*Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY,*
²*University of Freiburg – IMTEK, GERMANY, and* ³*University of Freiburg – BIOS, 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

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

Electrokinetic Microfluidics

W.088d

ELECTROKINETIC CONCENTRATION ON A MICROFLUIDIC CHIP USING POLYELECTROLYTIC GEL PLUGS FOR SMALL MOLECULE DETECTION

D. Han¹, Y.-R. Kim², J. Kim³, and T.D. Chung¹
¹*Seoul National University, SOUTH KOREA,* ²*University of Warwick, UK, and* ³*Kyung Hee University, SOUTH KOREA*

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 μ L-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 UNTETHERED 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

W.098e

CONTINUOUS FLOW CELL SEPARATION USING MICROFLUIDIC RATCHETS

C. Jin¹, S.M. McFaul¹, and H. Ma^{1,2}

¹University of British Columbia, CANADA and ²Vancouver General Hospital, CANADA

W.099e

LABEL-FREE CELL SEPARATION BASED ON SIZE AND DEFORMABILITY USING MICROFLUIDIC RESETTABLE CELL TRAPS

W. Beattie¹, X. Qin¹, and H. Ma^{1,2}

¹University of British Columbia, CANADA and ²Vancouver General Hospital, CANADA

W.100e

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

W.101e

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

Circulating Tumor Cells

W.102e

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

W.103e

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

W.104e

ULTRA-HIGH PURITY CAPTURE OF CIRCULATING TUMOR CELLS AND GENE MUTATIONS DETECTION

J. Autebert, B. Coudert, J. Champ, F.C. Bidard, J.Y. Pierga, S. Descroix, L. Malaquin, and J.L. Viovy

Institut Curie, FRANCE

Single Cell Analysis

W.105e

CELL ORDERING USING PINCH FLOW MICROCHANNEL FOR SINGLE CELL KINASE ASSAY

R. Ramji¹, A.A.S. Bhagat², C.T. Lim¹, and C.-H. Chen^{1,3}

¹National University of Singapore, SINGAPORE, ²ClearBridge Biomedics Pte. Ltd., SINGAPORE, and

³Singapore Institute for Neurotechnology (SiNAPSE), SINGAPORE

W.106e

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

W.107e

LAB-ON-A-CHIP SPECTROPHOTOMETRIC "FIELD OF QUALITY" ASSESSMENT OF DOG OOCYTES

P. Śniadek¹, R. Walczak¹, J. Dziuban¹, M. Woźna², M. Rybska², D. Bukowska², and J. Jaskowski²

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. Bürgel¹, F. Heer², and A. Hierlemann¹¹*ETH Zürich, SWITZERLAND and* ²*Zurich Instruments AG, SWITZERLAND***W.109e****OOCYTE MECHANICAL CHARACTERIZATION BY ROBOT INTEGRATED MICROFLUIDIC CHIP FOR HIGH-THROUGHPUT QUALITY EVALUATION**S. Sakuma¹ and F. Arai²¹*Osaka University, JAPAN and* ²*Nagoya 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. Ohara¹¹*Institute of Physical and Chemical Research (RIKEN), JAPAN,* ²*Kyoto University, JAPAN,* and ³*Waseda 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. Quake

*Stanford University, USA***Liposomes/Vesicles****W.112e****ACTIVE DRUG LOADING OF MICROFLUIDIC-SYNTHESIZED LIPOSOMES**R.R. Hood¹, W.N. Vreeland², and D.L. DeVoe¹¹*University of Maryland, USA and* ²*National 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 ELECTROSPRAY FOR MICROSCOPIC MEMBRANE PROTEIN ASSAYS**T. Osaki^{1,2}, K. Kamiya¹, R. Kawano¹, R. Iino^{2,3}, H. Noji^{2,3}, and S. Takeuchi^{1,2}¹*University of Tokyo, JAPAN,* ²*Kanagawa Academy of Science and Technology, JAPAN,* and³*Japan 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. Sugiura¹, K. Sumaru¹, S. Ozaki², S. Gomi², T. Kurakazu², Y. Oshima², and T. Kanamori¹¹*National Institute of Advanced Industrial Science and Technology (AIST), JAPAN and* ²*Tokyo 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**

S.G. Ricoult, G.H. Thompson-Steckel, J.P. Correia, T.E. Kennedy, and D. Juncker

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 COCLTURE 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 ACCUARATE 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

W.127e

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

W.128e

TIME-LAPSE SCREENING BY PARALLELIZED LENSFREE IMAGING

V. Haguët^{1,2,3}, P. Obeid^{1,2,3}, R. Griffin^{1,2,3,4}, D. Freida^{1,2,3}, L. Guyon^{1,2,3}, and X. Gidrol^{1,2,3}

¹Commissariat à l'énergie atomique (CEA), FRANCE, ²INSERM, FRANCE, ³University Grenoble-Alpes, FRANCE, and ⁴CNRS, FRANCE

Organs & Organisms

Organs on Chip

W.129f

HUMAN SPLEEN-ON-A-CHIP: DESIGN AND VALIDATION OF A MICROFLUIDIC MODEL RESEMBLING THE INTERSTITIAL SLITS AND THE FAST AND SLOW MICROCIRCULATIONS

L.G. Rigat-Brugarolas¹, M. Bernabeu², A. Elizalde², M. de Niz², L. Martin-Jaular², C. Fernandez-Becerra², A. Homs-Corbera¹, H.A. del Portillo², and J. Samitier¹

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

W.130f

ON-CHIP ABSORPTION AND METABOLISM MODEL FOR PHARMACOKINETIC STUDIES

H. Kimura¹, T. Ikeda², Y. Sakai², and T. Fujii²

¹Tokai University, JAPAN and ²University of Tokyo, JAPAN

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

W.131f

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

W.132f

ON-CHIP CHEMOTAXIS ASSAY OF PLANT-PARASITIC NEMATODE TOWARDS INCREASING GLOBAL CROP PRODUCTIVITY

H. Hida^{1,4}, H. Nishiyama², S. Sawa², T. Higashiyama^{1,3}, and H. Arata¹

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.)

W.133g

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

W.134g

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

W.135g**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

W.136g**PORTABLE DIGITAL MICROFLUIDIC/MASS SPECTROMETRY METHOD FOR QUANTIFICATION OF DRUGS OF ABUSE IN URINE**

N.M. Lafrenière¹, A.E. Kirby¹, B. Seale¹, E. Gritzan¹, J.T. Shelley², P.I. Hendricks², R.G. Cooks², and A.R. Wheeler¹
¹*University of Toronto, CANADA and* ²*Purdue University, USA*

Nucleic Acid Analysis (e.g. Digital PCR, Next Generation Sequencing)**W.137g****DETECTION OF OIL-UTILIZING MICROORGANISMS BY NUCLEIC ACID SEQUENCE-BASED AMPLIFICATION IN A TOTAL ANALYSIS LAB-ON-A-CHIP DEVICE**

B.K. Honsvall^{1,2}, A. Ezkerra^{3,4}, and F. Karlsen^{1,5}

¹*Vestfold University College, NORWAY*, ²*Trilobite Microsystems AS, NORWAY*, ³*CIC MicroGUNE, SPAIN*
⁴*IK4-Ikerlan, SPAIN*, and ⁵*NorChip AS, NORWAY*

W.138g**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

¹*Fraunhofer Research Institution for Modular Solid State Technologies EMFT, GERMANY and*
²*KTH Royal Institute of Technology, SWEDEN*

W.139g**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

W.140g**ON-CHIP MULTIPLEX PCR AMPLIFICATION DIRECTLY FROM WHOLE BLOOD**

R.S. Wiederkehr^{1,2}, B. Jones¹, S. Peeters¹, T. Stakenborg¹, O. Ibrahim^{3,4}, P. Fiorini¹, H. Tanaka⁵, I. Yamashita⁵, T. Matsuno⁵, and L. Lagae^{1,2}

¹*IMEC, BELGIUM*, ²*Katholieke Universiteit Leuven, BELGIUM*, ³*Alexandria University, Alexandria, EGYPT*, ⁴*Consortium Centre of Excellence for Nano-manufacturing Applications (CENA), SAUDI ARABIA*, and ⁵*Panasonic Corporation, JAPAN*

W.141g**THERMALLY-MULTIPLEXED MICROFLUIDIC PCR**

C.R. Phaneuf¹, N. Pak¹, D.C. Saunders¹, E. Popler², N. Nagpal¹, R. Jerris³, A. Shane², and C.R. Forest¹

¹*Georgia Institute of Technology, USA*, ²*Emory University, USA*, and ³*Children's Healthcare of Atlanta, USA*

Protein Analysis & Characterization (e.g. Proteomics)**W.142g****INTEGRATED MICROFLUIDIC FEMTOLITER ARRAY FOR QUANTITATIVE ELISA AT THE ATTOMOLAR LEVEL**

Y. Zeng and T. Wang

University of Kansas, USA

W.143g**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

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***Clinical Chemistry****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. Tsunoda¹¹*University of Tokyo, JAPAN and* ²*Waseda 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 RESPONSE 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. Kong^{1,2}, W.K. Peng¹, H.W. Hou⁴, Marcos², N.T. Nguyen^{1,2,3}, and J. Han^{1,4}¹*Singapore-MIT Alliance for Research and Technology (SMART), SINGAPORE,* ²*Nanyang Technological University, SINGAPORE,* ³*Griffith University, AUSTRALIA,* and ⁴*Massachusetts 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. Pekin^{1,2}, C. Normand¹, S. Kotsopoulos³, X. Li³, L. Benhaim¹, O. Bouché⁴, T. Lecomte⁵, D. Le Corre¹, T. Hor¹, Z. El Harrak¹, P. Nizard¹, D. Link³, J.B. Hutchison³, P. Laurent-Puig¹, and V. Taly¹¹*University Paris Descartes, FRANCE,* ²*Université de Strasbourg, FRANCE,* ³*Raindance Technologies, USA,*⁴*Centre Hospitalier Universitaire de Reims, FRANCE,* and ⁵*Université 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. Guber¹¹*Karlsruhe Institute of Technology, GERMANY and* ²*Heidelberg University, GERMANY*

W.152h**STREAMLINING CELL BIOLOGY WORKFLOWS: INTEGRATING SUSPENSION CULTURE, CELL LYSIS, PROTEIN EXTRACTION AND NUCLEIC ACID EXTRACTION**

T.E. de Groot, B.P. Casavant, K.S. Vesperat, L.N. Strotman, S.M. Berry, and D.J. Beebe
University of Wisconsin, USA

Personalized Medicine**W.153h****MULTIPLEX DETECTION OF KRAS POINT MUTATIONS FROM TUMOR CELL DNA ON A CENTRIFUGAL MICROFLUIDIC CARTRIDGE (GENESLICE) FOR CHOICE OF PERSONALIZED CANCER THERAPY**

O. Strohmeier^{1,2}, S. Laßmann^{3,4,5,6}, B. Riedel^{3,6}, M. Werner^{3,5,6}, D. Mark¹, R. Zengerle^{1,2,4}, and F. von Stetten^{1,2}
¹*Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY*, ²*University of Freiburg - IMTEK, GERMANY*, ³*University Medical Center Freiburg, GERMANY*, ⁴*University of Freiburg - BIOS, GERMANY*, ⁵*Comprehensive Cancer Center Freiburg, GERMANY*, and ⁶*German Cancer Consortium (DKTK) and German Cancer Research Center (DKFZ), GERMANY*

Drug Delivery Systems**W.154h****CHARACTERIZATION OF NANOPARTICLE PERMEABILITY ON A MEMBRANE-INTEGRATED MICROFLUIDIC DEVICE**

N. Sasaki¹, M. Tatanou², Y. Anraku³, A. Kishimura⁴, K. Kataoka³, and K. Sato²
¹*Toyo University, JAPAN*, ²*Japan Women's University, JAPAN*, ³*University of Tokyo, JAPAN*, and ⁴*Kyushu University, JAPAN*

W.155h**MICROFLUIDIC DEVICE FOR MICROINJECTION OF CAENORHABDITIS ELEGANS**

R. Ghaemi, J. Tong, P.R. Selvaganapathy, and B.P. Gupta
McMaster University, CANADA

W.156h**SINGLE-STEP DRUG CRYSTALLIZATION AND FORMULATION - 'DESIGNER' PHARMACEUTICALS ENABLED BY MICROFLUIDICS**

R.A.L. Leon¹, W.Y. Wan¹, A.Z.M. Badruddoza¹, T.A. Hatton^{2,3}, and S.A. Khan^{1,2}
¹*National University of Singapore, SINGAPORE*, ²*Singapore-MIT Alliance for Research and Technology (SMART), SINGAPORE* and ³*Massachusetts Institute of Technology, SINGAPORE*

Regenerative Medicine & Tissue Engineering**W.157h****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

W.158h**MATHEMATICAL MODELING FOR THE SELF-ORGANIZATION OF CELLS**

N. Kojima¹, Y. Ogata², S. Nakaoka³, and Y. Sakai¹
¹*Yokohama City University, JAPAN*, ²*University of Tokyo, JAPAN*, and ³*Riken Yokohama Institute, JAPAN*

W.159h**SKIN PRINTER: MICROFLUIDIC APPROACH FOR SKIN REGENERATION AND WOUND DRESSINGS**

L. Leng¹, S. Amini-Nik^{1,2}, Q. Ba¹, M. Jeschke^{1,2}, and A. Günther¹
¹*University of Toronto, CANADA* and ²*Sunnybrook 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. Yamada¹, S. Hiyama¹, T. Toyooka¹, H. Onoe², and S. Takeuchi²

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. Hou¹, M.P. Vera², B.D. Levy², R.M. Baron², and J. Han¹

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. Zhao¹, F. Pereira², A. de Mello², H. Morgan¹, and X. Niu¹

¹University of Southampton, UK, and ²ETH Zürich, SWITZERLAND

W.166i

ELECTROSMOTICALLY ACTUATED ON-CHIP SOLID-PHASE EXTRACTION WITH MICROCHIP ELECTROPHORESIS-ELECTROSPRAY IONIZATION MASS SPECTROMETRY

N. Nordman¹, B. Barrios-Lopez¹, S. Laurén², P. Suvanto², T. Kotiaho¹, S. Franssila², R. Kostiaainen¹, and T. Sikanen¹

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 NANOCCLUSERS FOR ELECTROPHORETIC SEPARATIONS IN MICROCHANNELS**

J.T. Del Bonis-O'Donnell, D. Fyngenson, 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**Microrreactors & 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. Inoue^{1,3}, R. Kawano¹, H. Yasuga^{1,3}, M. Takinoue⁴, T. Osaki^{1,2}, K. Kamiya¹, N. Miki^{1,3}, and S. Takeuchi^{1,2}

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. Yanagida², S. Rahong², M. Kanai², K. Nagashima², H. Yukawa¹,
N. Kaji¹, T. Kawai², and Y. Baba^{1,3}
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. Ho^{2,3}, 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. Pihosh^{1,2}, H. Chinen¹, K. Mawatari^{1,2}, and T. Kitamori^{1,2}
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. Přibylka, 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.1851

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.1861

DROPLET-BOX: A PLATFORM FOR BIOLOGICAL-NANOPORE-BASED LOGICAL OPERATION USING LIPID-COATED DROPLET NETWORK

H. Yasuga^{1,3}, R. Kawano¹, M. Takinoue⁴, Y. Tsuji¹, T. Osaki^{1,2}, K. Kamiya¹, N. Miki^{1,3}, and S. Takeuchi^{1,2}

¹Kanagawa Academy of Science and Technology, JAPAN, ²University of Tokyo, JAPAN, ³Keio University, JAPAN, and ⁴Tokyo Institute of Technology, JAPAN

W.1871

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.1881

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.1891

AUTOMATED ON-SITE DETECTION OF ORGANOPHOSPHOROUS PESTICIDES IN REAL FOOD SAMPLES

L. Drechsel¹, M. Schulz¹, F. von Stetten^{1,2}, R. Zengerle^{1,2,3}, and N. Paust^{1,2}

¹Institute for Micromachining and Information Technology (HSG-IMIT), GERMANY,

²University of Freiburg – IMTEK, GERMANY, and ³University of Freiburg – BIOS, 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. Sugiura², 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

M. Zheng, J.W. Shan, H. Lin, D.I. Shreiber, and J.D. Zahn

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. Oskoei, 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 ITS ELECTRICAL AND MECHANICAL CHARACTERIZATION

M. Kumemura¹, S.L. Karsten², N. Lafitte¹, H. Guillou³, L. Jalabert¹, H. Fujita⁴, and D. Collard^{1,4}
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. Zengerle^{3,4}
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. Takeuchi^{1,2}
¹University of Tokyo, JAPAN and ²Japan Science and Technology Agency (JST), JAPAN

10:25 - 10:45

ANALYSIS OF AXON GUIDANCE IN SINGLE NEURONS USING A LARGE ARRAY OF MICROFLUIDIC GRADIENT GENERATORS

N. Bhattacharjee, and A. Folch
University of Washington, USA

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

Session 4A2 - Spatial Control of Chemistry

11:15 - 11:35

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
¹*Massachusetts Institute of Technology, USA* and ²*Brigham and Women's Hospital, USA*

11:35 - 11:55

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
¹*Pennsylvania State University, USA* and ²*Ascent Bio-Nano Technologies Inc., USA*

11:55 - 12:15

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
¹*Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA* and
²*Khalifa University of Science, Technology & Research (KUSTAR), UAE*

12:15 - 12:35

MICROFLUIDICS TO EXPLORE SPATIAL BEHAVIOR OF SYNTHETIC BIOCHEMICAL NETWORKS

A. Estévez-Torres¹, L. Mzali¹, A. Kalley¹, A. Zadorin¹, Y. Rondelez², and J.-C. Galas¹
¹*LPN-CNRS, FRANCE* and ²*University of Tokyo, JAPAN*

Session 4B2 - Cell Biology

11:15 - 11:35

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

11:35 - 11:55

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

11:55 - 12:15

DISPOSABLE MICROFLUIDIC CHIP WITH INTEGRATED LIGHT SHEET ILLUMINATION ENABLES DIAGNOSTICS BASED ON MEMBRANE VESICLES

H. Deschout¹, K. Raemdonck¹, S. Stremersch¹, P. Maoddi², G. Mernier², P. Renaud², S. Jiguet², A. Hendrix³, M. Bracke³, R. Van den Broecke³, M. Röding⁴, M. Rudemo⁴, J. Demeester¹, S. De Smedt¹, F. Strubbe¹, K. Neyts¹, and K. Braeckmans¹
¹*Ghent University, BELGIUM*, ²*Ecole Polytechnique Fédérale de Lausanne, SWITZERLAND*,
³*Ghent University Hospital, BELGIUM*, and ⁴*Chalmers University of Technology, SWEDEN*

12:15 - 12:35

PULSED STIMULATION VIA MICROFLUIDICS REVEALS SHORT AND LONG-TERM MEMORIES IN MAST CELLS

Y. Liu¹, W.S. Hlavacek³, B.R. Schudel¹, A. Mahajan, C.H. Hayden¹, D.S. Lidke², B.W. Wilson², and A.K. Singh¹
¹*Sandia National Laboratory, USA*, ²*Los Alamos National Laboratory, USA*, and ³*University 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 Zurich, 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. Mawatari^{1,3}, V. Vogel², and T. Kitamori^{1,3}

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 ADJOURNS**