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H. Chun1, J.P. Alarie2, and J.M. Ramsey2
1Seoul National University, SOUTH KOREA and 2University of North Carolina, USA

W6C DOWNSCALING QUANTITATIVE ISOTACHOPHORESIS: LIMITS AT THE SUB-PICOLITER SCALE .................................................................................................................. 1730
K.G.H Janssen1, J. Li1, H.T. Hoang2, N.R. Tas2, H.J. van der Linden1, and T. Hankemeier1
1Leiden University, THE NETHERLANDS and 2MESA+, University of Twente, THE NETHERLANDS

W7C FLUORESCENCE IMAGING ANALYSIS OF TRANSIENT TRAPPING–MICROCHIP MICELLAR ELECTROKINETIC CHROMATOGRAPHY ................................................. 1733
K. Sueyoshi, F. Kitagawa, and K. Otsuka
Kyoto University, JAPAN

W8C ION-PAIR REVERSED PHASE LIQUID CHROMATOGRAPHY OF DNA IN DEEP-UV PATTERNS SILICON PILLAR ARRAYS .......................................................... 1736
W. De Malsche1,2, L. Zhang1, J. Op De Beeck1, J. Vangelooven1, M. Hiraoka2,3, I. Yamashita1, B. Majedi2, M. Op de Beeck2, P. Fiorini2, and G. Desmet1
1Vrije Universiteit Brussel, BELGIUM, 2IMEC, BELGIUM, and 3Panasonic, JAPAN

W9C MIGRATION AND SEPARATION OF PHOTO-ABSORBING MICRO-PARTICLES USING LASER-PHOTOPHORESIS IN AQUEOUS SOLUTION ............................. 1739
H. Monjushiro1, M. Takahashi2, and H. Watarai2
1High Energy Accelerator Research Organization, JAPAN and 2Osaka University, JAPAN
W10C  SAMPLE STACKING CAPILLARY ELECTROPHORETIC MICRODEVICE FOR HIGHLY SENSITIVE MINI Y SHORT TANDEM REPEAT GENOTYPING ........................................ 1742
Y. Chen, J.Y. Choi, S.J. Choi, and T.S. Seo
Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA

Poster Session Other Applications - Food & Nutrition

W11C  INTEGRATED OPTOFLUIDIC SYSTEM FOR CHARACTERIZATION OF RED WINES .......... 1745
M. Gutiérrez1, C. Domingo2, J. Vila-Planas1, F. Capdevila2, S. Demming3, S. Büttgenbach3,
A. Llobé1, and C. Jiménez-Jorquera1
1Instituto de Microelectrónica de Barcelona (IMB-CNMI, SPAIN,
2Estació de Viticultura i Enologia, INCAVI, SPAIN, and 3Institut für Mikrotechnik, GERMANY

W12C  SCALING AND MANUFACTURING OF LAMINAR FLOW-BASED FUEL CELLS ....................... 1748
A.S. Hollinger1, F.R. Brushett1, L.J. Markoski2, and P.J.A. Kenis1
1University of Illinois, Urbana-Champaign, USA and 2INI Power Systems, USA

Poster Session Other Applications - Others

W13C  ULTRASONIC MANIPULATION OF MICRON SIZE BUBBLES IN NANO-LITHOGRAPHY .......... 1751
M. Baragona1, R. in 't Groen1, M. Kovacevic-Milivojevic2, R. Maessen1, M. Riepen2,
R. Badić2, and J. den Toonder1

Poster Session Microfluidics - Fluid Mechanics & Modeling

W1D  CHARACTERIZATION OF A HYDRODYNAMIC WELL FOR NON-INVASIVE TRAPPING OF SINGLE CELLS ........................................................................................................ 1754
C.-C. Tseng, C.-M. Lin, and A.M. Wo
National Taiwan University, TAIWAN

W2D  EFFECTS OF ELECTROTHERMAL FLOW ON PARTICLE DEFLECTION AND TRAPPING IN INSULATING (ELECTRODELESS) DIELECTROPHORESIS DEVICES .............. 1757
B.G. Hawkins and B.J. Kirby
Cornell University, USA

W3D  HIGHLY PRACTICAL, MODEL-BASED SIMULATION PLATFORM FOR INTEGRATED MICRO-FLUID CIRCUIT .................................................................................. 1760
R. Miyake1, S. Okabe1, H. Tsudome2, Y. Endo2, K Mawatari3, and T. Kitamori3
1Hiroshima University, JAPAN, 2Hitachi Plant Technologies, JAPAN, and 3University of Tokyo, JAPAN

W4D  MIXING ANALYSIS OF NEUTRALLY BUOYANT PARTICLES OF FINITE SIZE IN COMPLEX FLOW AIDED BY A NOVEL SINGLE-FIELD THREE-DIMENSIONAL EPIFLUORESCENCE PARTICLE IMAGING TECHNIQUE ........................................ 1763
A.M. Hirsch, B. Zhang, C.-Y. Kuo, and H. Lu
Georgia Institute of Technolgy, USA

W5D  OPTIMUM PECLET NUMBERS FOR ACCURATE MEASUREMENT OF ELECTROOSMOTIC MOBILITY OF COMPLEX DNA BUFFERS IN MICRO/NANOFLUIDICS ........................................ 1766
W. Wang and Y.-K. Lee
Hong Kong University of Science and Technology, HONG KONG

W6D  PARTICLE FOCUSING IN A STRAIGHT SQUARE MICROCHANNEL VIA COMBINATION OF INERTIAL AND ELASTIC FLOW ................................................................. 1769
S. Yang1, S.S. Lee2, S.J. Lee2, and J.M. Kim1
1Ajou University, SOUTH KOREA, 2ETH Zürich, SWITZERLAND, and
3University of Suwon, SOUTH KOREA
Poster Session Microfluidics - Micro Liquid Handling

W7D  A PHASE REPLACEMENT-TRIGGERED MICROVALVE FOR PROTEIN CRYSTALLIZATION BY FREE INTERFACE DIFFUSION ................................................................. 1772
G. Li, Q. Chen, and J. Zhao
Chinese Academy of Sciences, CHINA

W8D  ACCURATE AND RELIABLE MULTI CHAMBER PCR CHIP WITH SAMPLE LOADING AND PRIMER MIXING USING VACCUM JACKETS FOR n × m QUANTITATIVE ANALYSIS .......... 1775
N.B. Trung1, M. Saito2, E. Tamiya2, and Y. Takamura1
1Japan Advanced Institute of Science and Technology (JAIST), JAPAN and 2Osaka University, JAPAN

W9D  AN OPEN-SURFACE MICRO-DISPENSER VALVE FOR THE LOCAL STIMULATION OF CONVENTIONAL TISSUE CULTURES ................................................................. 1778
C.G. Sip and A. Folch
University of Washington, USA

W10D DEVELOPMENT OF ON-CHIP AUTOMATIC CELL SENSING AND EJECTION SYSTEM .... 1781
T. Kawahara1, T. Mizunuma2, H. Uvet1, M. Hagiwara1, Y. Yamanishi1, and F. Arai1
1Nagoya University, JAPAN, 2Tohoku University, JAPAN, and
3Japan Science and Technology Agency (JST), JAPAN

W11D INCREASING THE FLUID FLOW VELOCITY IN A MICROCHANNEL USING 3D NON-METALLIC ELECTRODES .................................................................................. 1784
H.A. Rouabah1, B.Y. Park2, R.B. Zaouk2, M.J. Madou1, H. Morgan1, and N.G. Green1
1University of Southampton, UK and 2University of California, Irvine, USA

W12D MICROFLUIDIC NETWORK-BASED COMBINATORIAL DILUTION DEVICE WITH AN INITIAL CONCENTRATION CONTROLLER ................................................................. 1787
K. Lee1, C. Kim2, Y. Kim3, B. Ahn1, J. Bang2, J. Kim1, Y.-K. Yoon1, J.Y. Kang2, and K.W. Oh1
1University at Buffalo, The State University of New York, USA and
2Korea Institute of Science and Technology (KIST), SOUTH KOREA

W13D ON-CHIP LIQUID DEGASSING WITH LOW WATER LOSS ................................................................. 1790
J.M. Karlsson, T. Haraldsson, N. Sandström, G. Stemme, A. Russom, and W. van der Wijngaart
Royal Institute of Technology (KTH), SWEDEN

W14D VERTICAL MICROFLUIDIC PROBE HEADS .................................................................................. 1793
R.D. Lovchik, U. Drechsler, and E. Delamarche
IBM Research, Zurich, SWITZERLAND

W15D SAMPLE VOLUME METERING IN A DISPOSABLE MICROFLUIDIC CARTRIDGE .................. 1796
S. Vanhanen, P. Järvelä, and P. Kallio
Tampere University of Technology, FINLAND

W16D NUMERICAL MODELLING OF THERMOCAPILLARY FLOW ON SUPERHYDROPHOBIC SURFACES ................................................................. 1799
T. Baier, C. Steffes, and S. Hardt
Technische Universität Darmstadt, GERMANY

Poster Session Microfluidics - Multi-Phase and Digital Microfluidics

W17D  A HOMOGENEOUS ASSAY FOR BIOMOLECULE INTERACTION ANALYSIS IN DROPLETS BY FLOURESCENCE POLARIZATION ................................................................. 1802
H. Joensson, C. Zhang, M. Uhlén, and H. Andersson Svalhn
Royal Institute of Technology (KTH), SWEDEN

W18D  BUBBLES NO MORE: TRAPPING AND REMOVAL OF GAS BUBBLES IN SINGLE-LAYER ELASTOMERIC DEVICES ................................................................. 1805
C. Lochovsky, S. Yasoorthan, and A. Günther
University of Toronto, CANADA
W19D CONTROLLED DROP GENERATION FOR DIGITAL MICROFLUIDIC SYSTEMS BY MEANS OF ELECTROWETTING ................................................................. 1808
H. Gu, M.H.G. Duits, and F. Mugele
MESA+, University of Twente, THE NETHERLANDS

W20D DROPLET MICROFLUIDIC SYSTEM FOR HIGH-THROUGHPUT SCREENING OF TOXICITY OF ANTIBIOTICS ................................................................. 1811
K. Churski, T. Kamiński, S. Jakiela, P. Korczyk, and P. Garstecki
Polish Academy of Sciences, POLAND

W21D GENERATION OF CONCENTRATION GRADIENTS IN DROPLET-BASED MICROFLUIDIC SYSTEM WITH A SINGLE NANOLITER-SCALE INJECTION ................................................................................... 1814
L.F. Cai and Q. Fang
Zhejiang University, CHINA

W22D MAGNETIC DROPLETS - GENERATION AND MANIPULATION IN CONTINUOUS FLOW .... 1817
E. AlHetlani, O.J. Hatt, M. Vojtišek, M.D. Tarn, and N. Pamme
University of Hull, UK

W23D MULTIPLE EMULSION FORMATION IN CROSS-SHAPED MICROCHANNEL USING ALTERNATIVE DROPLET GENERATION TECHNIQUE .................................................................................. 1820
J. Shimamura, Y. Yokoyama, H. Moriguchi, and T. Torii
University of Tokyo, JAPAN

W24D ON-DROP SEPARATION AND SENSING WITH COMPOUND DROPLET MICROFLUIDICS ........ 1823
Z. Barikbin¹, M.T. Rahman¹, P. Parthibinan², A.S. Rane¹, V. Jain¹, and S.A. Khan¹²
¹Singapore-MIT Alliance for Research and Technology (SMART) Centre, SINGAPORE and ²National University of Singapore, SINGAPORE

W25D SELF-SORTING OF DEFORMABLE PARTICLES IN A MICROFLUIDIC CIRCUIT .................. 1826
M.S. Raafat, M. Cartas Ayala, and R. Karnik
Massachusetts Institute of Technology, USA

W26D SOLUTION CONCENTRATION CHANGE OF PICOLITER-SIZED MICRODROPLET REACTORS .................................................................................. 1829
M. Takinoue, H. Onoe, and S. Takeuchi
University of Tokyo, JAPAN

Poster Session Microfluidics - Multi-Scale/Integrative Microfluidics

W27D INTEGRATED MICROFLUIDICS FOR SEROTYPE IDENTIFICATION OF FOOT AND MOUTH DISEASE VIRUS ................................................................. 1832
H. Sant¹, S. Sundberg¹, A. Miles², M. Johnson¹, E. Liddiard¹, and B. Gale¹²
¹University of Utah, USA and ²Wasatch Microfluidics, USA

W28D MICROFLUIDIC CULTURE CHAMBER FOR THE LONG-TERM PERFUSION AND PRECISE CHEMICAL STIMULATION OF ORGANOTYPIC BRAIN TISSUE SLICES ........................ 1835
H.H. Caicedo¹, M. Vignes², B. Brugg², and J.M. Peyrin²
¹University of Illinois, Chicago, USA, ²Universite Pierre et Marie Curie, FRANCE, and ³Institut Curie, FRANCE

W29D PRECISION MICROFLUIDIC OSCILLATORS FOR ON-CHIP TIMING AND CONTROL ........ 1838
P.N. Duncan, T.V. Nguyen, and E.E. Hui
University of California, Irvine, USA

Poster Session Microfluidics - Others

W30D ACTIVE MICROFLUIDIC MIXER USING VIRTUAL SOURCE-SINK PAIRS FOR DNA PURIFICATION .................................................................................. 1841
H.C. Tekin, C. Vandevyver, and M.A.M. Gijs
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND
W31D  FLOATING MICROFLUIDIC GRADIENTS ................................................................. 1844
M.A. Qasaimeh and D. Juncker
McGill University, CANADA

W32D  MICROFLUIDIC GENERATION OF MAGNETIC SEMIFLEXIBLE CHAIN BASED ON CHITOSAN MICROCAPSULES ................................................................. 1847
K. Jiang, C. Arya, S.R. Raghavan, and D.L. DeVoe
University of Maryland, USA

W33D  OPTOFLUIDIC FABRICATION OF FOLDABLE HYDROGEL PARTICLES TOWARD INTUITIVE DRUG DELIVERY CARRIERS .................................................. 1850
Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA

W34D  USE OF INTEGRATED ELECTRODES AND EMBRYO TRAPS FOR INDIVIDUALLY ADDRESSABLE LOADING, CULTURING AND MONITORING OF C. elegans ........................................ 1853
J. Krajniak and H. Lu
Georgia Institute of Technology, USA

Poster Session Nanotechnologies - Nanofluidics

W1E  CLOSED-END NANOCANALS: MODEL PLATFORM FOR NANOFLUIDIC FLOWS .......... 1856
P. Joseph1, V.N. Phan2, P Dubreuil1, P. Abgrall2, A.-M. Gué1, and N.-T. Nguyen2
1Université de Toulouse, FRANCE and 2Nanyang Technological University, SINGAPORE

W2E  SELECTIVE PRECONCENTRATION WITHIN MICRO-NANOFLUIDIC DEVICE: A SINGLE STEP FOR ON CHIP BIOMOLECULE PRECONCENTRATION AND SEPARATION .............. 1859
C. Nanteuil, A.C. Louër, A. Plecis, and A.M. Haghiri-Gosnet
Centre National de la Recherche Scientifique (CNRS), FRANCE

Poster Session Nanotechnologies - Nanoengineering

W3E  VERTICAL NANOTUBES CONNECTED BY A SUBSURFACE NANOCHANNEL ......................... 1862
H. Persson1, J. Beech1, W. Hällström1, C. Niman1, L. Samuelson1, M. Kanje1, S. Oredsson1, C.N. Prinz1, and J.O. Tegenfeldt1,2
1Lund University, SWEDEN and 2University of Gothenburg, SWEDEN

Poster Session Nanotechnologies - Nanobiotechnology

W4E  AN OPEN MICROFLUIDIC DEVICE WITH ACTIVE VALVES FOR ACCURATE TRAPPING OF DNA BY SILICON NANOTWEEOEZERS ...................................................... 1865
N. Lafitte, M. Kumenura, M. Nagai, L. Jalabert, D. Collard, and H. Fujita
University of Tokyo, JAPAN

W5E  DYNAMIC TRACKING OF SINGLE CELL SYNTHESIS OF CdSe QUANTUM DOTS WITH A MICROFLUIDIC DEVICE ............................................................. 1868
L. Wang1, Z.-L. Zhang1, R. Cui1, H.-H. Liu1, J. Li1, S.-L. Liu1, Z.-X. Xie1, Y. Chen1, and D.-W. Pang1
1Wuhan University, CHINA and 2Ecole Normale Supérieure, FRANCE

W6E  FABRICATION OF SILICON NANOPLATE AND NANOWIRE BIOSENSOR ARRAYS WITH HIGH SPECIFICITY AND SUB-PICOMOLAR LIMITS OF DETECTION ...................................... 1871
B. Dorval1, B. Reddy Jr.1, D. Bergstrom1, M.A. Alan2, S. Clare3, and R. Bashir1
1University of Illinois, Chicago, USA, 2Purdue University, USA, and 3Indiana University School of Medicine, USA

W7E  NANOFLUIDIC SINGLE-MOLECULE SORTER CONCEPTUALLY PROVEN BY SORTING OF DNA ................................................................................................. 1874
T. Yamamoto1 and T. Fujita2
1Tokyo Institute of Technology, JAPAN and 2University of Tokyo, JAPAN
W8E  ON-CHIP NANOMANIPULATION OF SINGLE INFLUENZA VIRUS USING DIELECTROPHORETIC CONCENTRATION AND OPTICAL TWEEZERS ........................................ 1877
H. Maruyma¹, K. Kotani², A. Honda³, T. Takahata¹, and F. Arai¹
¹Nagoya University, JAPAN, ²Tohoku University, JAPAN, and ³Hosei University, JAPAN

W9E  REAL-TIME OBSERVATION OF DNA COMFORMATIONAL TRANSITIONS AT A SINGLE-MOLECULE LEVEL BY MICROFLUIDIC DEVICES ......................................................... 1880
H. Suzuki¹, N. Kaji¹, Y. Okamoto¹, M. Tokeshi¹, and Y. Baba¹,²
¹Nagoya University, JAPAN and ²National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

Poster Session Nanotechnologies - Nanoassembly

W10E  SIMULTANEOUS CONTROL OF LENGTH AND LOCATION OF METAL-ORGANIC NANOWIRES GROWN BY HYDRODYNAMIC FOCUSING IN A MULTILAYER MICROFLUIDIC DEVICE ............................................................................................. 1883
P. Kuhn¹, I. Puigmartí-Luis¹, I. Imaz², D. Maspoch², and P.S. Dittrich¹
¹ETH Zürich, SWITZERLAND and ²Centre d’Investigaciones en Nanociencia i Nanotecnologia (ICN-CSIC), SPAIN

Poster Session Nanotechnologies - Nanostructured Materials

W11E  CHEMICAL SG-SELEX ON THE NANOPOROUS SILICON SUBSTRATE CAN GENERATE HIGH AFFINITY ssDNA APTAMERS AGAINST NON-SOLUBLE CHEMICALS ........................................ 1886
J.-Y. Ahn¹, S.W. Lee², M. Jo³, M. Kim¹, H. Bae¹, T. Laurell², O.C. Jeong³, and S. Kim¹
¹Dongguk University, SOUTH KOREA, ²Lund University, SWEDEN, and ³Inje University, SOUTH KOREA

W12E  INVESTIGATION OF PHONON-ASSISTED OPTICAL NEAR-FIELD EXCITATION ON NANOSTRUCTURED TiO₂ TOWARDS ON-CHIP FUEL CELL APPLICATION .................. 1889
University of Tokyo, JAPAN

W13E  SELECTIVE DEPOSITION OF ELECTROSPUN ALGINATE-BASED NANOFIBERS ON CELL-REPELLING HYDROGEL SURFACES FOR CELL-BASED MICROARRAY ............. 1892
S.H. Huang¹, T.C. Chien¹, K.Y. Hung², and Y.C. Chung²
¹National Taiwan Ocean University, TAIWAN and ²Mingchi University of Technology, TAIWAN

Poster Session MEMS & NEMS Technologies - Micro- & Nanomachining

W1F  A NOVEL FABRICATION METHOD OF HOLLOW NANONEEDLES APPLICABLE FOR SINGLE CELL OPERATION ................................................................. 1895
Y. Zhang, X. Ji, C. Li, W. Wu, and Z. Li
Peking University, CHINA

W2F  ENHANCED MICROFABRICATION CAPABILITIES OF THERMOPLASTICS ELASTOMERS FOR CD LAB SYSTEM INCLUDING: LYSING, PCR AND HYBRIDIZATION MICROFLUIDIC FUNCTIONS ........................................ 1898
E. Roy¹, M. Mounier¹, R. Peytavi¹, J. Siegrist¹, R. Gorkin¹, M. Madou¹, M.G. Bergeron¹, M. Veres¹, and H.J. Sant¹
¹National Research Council Canada, CANADA, ²Laval University, CANADA, and ³University of California, Irvine, USA

W3F  FABRICATION OF A MRI STANDARDIZATION DEVICE BY STACKING HIGHLY PATTERNED THIN PDMS LAYERS .................................................................................. 1901
University of Utah, USA

W4F  FLEXIBLE MICROPOST ARRAYS FOR STUDYING TRACTION FORCES OF VASCULAR SMOOTH MUSCLE CELLS ................................................................. 1904
Q. Cheng, Z. Sun, G.A. Meininger, and M. Almasri
University of Missouri, USA
W5F  MICROMACHINING OF PYREX7740 GLASS FOR MICRO-FLUIDIC DEVICES ................................. 1907
J.W. Liu, Q.A. Huang, J.T. Shang, and J.Y. Tang
Southeast University, CHINA

W6F  WAX PATTERNS BY DECAL-TRANSFER-MICROLITHOGRAPHY AND ITS USE FOR LOW-TEMPERATURE-BONDING OF BIO-FUNCTIONALIZED µTAS ....................................................... 1910
M. Díaz-González and A. Baldi
Instituto de Microelectrónica de Barcelona (IMB-CNM), SPAIN

Poster Session MEMS & NEMS Technologies - Microfluidic Components/Packaging

W7F  A DISPOSABLE MICROFLUIDIC ARRAY PLATFORM FOR AUTOMATIC ION CHANNEL RECORDING .................................................................................................................. 1913
M. Rossi1, F. Thei1, H. Morgan2, and M. Tartagni1
1University of Bologna, ITALY and 2University of Southampton, UK

W8F  ALL IN ONE LATERAL-FLOW CHIP FOR ARRAY IMMUNOASSAY ........................................... 1916
NTT Microsystem Integration Laboratories, JAPAN

W9F  FREQUENCY ADDRESSABLE ACOUSTIC COLLECTION, SEPARATION AND MIXING IN A PZT DRIVEN GLASS CAPILLARY MICROFLUIDIC ACTUATOR ................................. 1919
M.K. Araz and A. Lal
Cornell University, USA

W10F METABOLOMIC NMR BY INDUCTIVE COUPLING ............................................................................... 1922
A. Zaß1, K. Wang1, J. Korvink1, M. Reed2, J. Landers1, and M. Utz1
1University of Virginia, USA and 2Albert Ludwig - Universität, GERMANY

W11F PDMS NANOSTRUCTURES FABRICATED BY TWO-STEP MOLDING PROCESS USED FOR TUNABLE SERS INTEGRATED WITH MICROFLUIDICS ................................................. 1925
X. Wang1, Z. Geng1,2, W. Wang1, and Z. Li1
1Peking University, CHINA and 2Minzu University, CHINA

Poster Session MEMS & NEMS Technologies - Integration Strategies

W12F  A TWO CHAMBER SU8 LABONACHIP WITH INTEGRATED BURST VALVE FOR SAMPLE PREPARATION, SAMPLE CONCENTRATION AND PCR .............................................. 1928
V. Calvo1, M. Agirregabiria1, L.J. Fernandez1, A. Ezkerra1, J. Berganzo1, J. Elizalde1, K. Mayora1, D. Verdoí2, and J.M. Ruano-Lopez1
1Ikerlan S. Coop, SPAIN and 2Gaiker, SPAIN

W13F  FACILE AND CONTROLLED INTEGRATION OF FUNCTIONAL NANOSTRUCTURES IN MICROFLUIDIC DEVICE ............................................................................................. 1931
J. Kim and I. Park
Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA

Poster Session MEMS & NEMS Technologies - New Chip Materials

W14F  FLUOROTHERMOPLASTIC CHIPS FOR DROPLET MICROFLUIDICS AND DNA ANALYSIS .......................... 1934
S. Begolo, G. Colas, L. Malaquin, and J.-L. Violy
Institut Curie, FRANCE

W15F  MICROFLUIDIC DEVICES MADE OF UV-CURABLE GLUE (NOA81) FOR FLUORESCENCE DETECTION BASED APPLICATIONS ................................................................. 1937
Ph. Wägli, B.Y. Guélat, A. Homsy, and N.F. de Rooij
École Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND

Poster Session MEMS & NEMS Technologies - Surface Modification

W16F  A HEMOCOMPATIBLE ARRAY CYLINDRICAL NANOSHELL WITH A REDUCED EFFECTIVE BLOOD CONTACT AREA ............................................................................................. 1940
H. Im, Y.-B. Park, J. Suk, M. Im, C.O. Joe, and Y.-K. Choi
Korea Advanced Institute of Science and Technology (KAIST), SOUTH KOREA
W17F  IN-SITU SOL-GEL MODIFICATION OF PDMS ELECTROPHORETIC ANALYTICAL DEVICES ................................................................. 1943
I. Hoek¹, A. Bubendorfer¹, T. Kemmitt¹,², and W.M. Arnold¹,²
¹Industrial Research Ltd., NEW ZEALAND and ²Victoria University, NEW ZEALAND

W18F  SIMPLE AND FUNCTIONAL MODIFICATION OF PDMS SURFACE FOR MICROCHANNEL ELECTROPHORESIS ........................................... 1946
T. Shirai, M. Takai, and K. Ishihara
University of Tokyo, JAPAN

W19F  WETTABILITY PATTERNING IN MICROFLUIDIC SYSTEMS BY POLY(ACRYLIC ACID) GRAFT POLYMERIZATION ........................................... 1949
M.H. Schneider¹,², B. Kozlov¹,², H. Willaime¹, Y. Tran¹, F. Rezgui², and P. Tabeling¹
¹École Supérieure de Physique et de Chimie Industrielles (ESPCI), FRANCE and
²Études et Production Schlumberger, FRANCE

Poster Session Imaging & Detection Technologies - Flow Visualization

W1G  MEASUREMENT OF PERIODIC FLOW USING MICRO PARTICLE IMAGE VELOCIMETRY WITH PHASE SAMPLING TECHNIQUE ................................................. 1952
W.-I. Wu, D. Ewing, P.R. Selvaganapathy, and C.Y. Ching
McMaster University, CANADA

Poster Session Imaging & Detection Technologies - Optical

W2G  A POLYMERIC MICRO-OPTIC DEVICE FOR THE DETECTION OF MICROFLUIDIC FLOW SPATIAL PROFILE ................................................................. 1955
F. Sapupo¹, A. Llobera², F. Schembri¹, and M. Bucolo¹
¹Università degli Studi di Catania, ITALY and ²Centro Nacional de Micro electrónica (CNM), SPAIN

W3G  CMOS-BASED LUMINESCENCE DETECTION FOR LAB-ON-A-CHIP ................................................................. 1958
L. Shen¹, M. Ratterman¹, D. Klotzkin², and I. Papautsky¹
¹University of Cincinnati, USA and ²State University of New York, Binghamton, USA

W4G  FIBER FREE PLUG AND PLAY ON-CHIP SCATTERING CYTOMETER MODULE – FOR IMPLEMENTATION IN MICROFLUIDIC POINT OF CARE DEVICES ................................................................. 1961
T.G. Jensen and J.P. Kutter
Danmarks Tekniske Universitet (DTU), DENMARK

W5G  HYDRATION LAYERS OF ALCOHOL AND PROTEINS ANALYZED BY THZ BIOMEMS ...... 1964
S. Laurette, A. Treizebre, and B. Bocquet
Université de Lille, FRANCE

W6G  INVESTIGATION OF PLASMONIC NANODOT ARRAYS COMPARED WITH NANOHOLE ARRAYS FABRICATED BY A SEQUENTIAL NANOIMPRINT TECHNIQUE ................................................................. 1967
K. Nakamoto¹,², R. Kurita², and O. Niwa¹,²
¹University of Tsukuba, JAPAN and
²National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

W7G  LONG-RANGE SPR SENSOR WITH MICRO LIQUID CHANNELS FOR MAINTAINING SYMMETRICAL CONDITION ................................................................. 1970
T. Kan¹, H. Kojo², E. Iwase¹, K. Matsumoto¹, and I. Shimoyama¹
¹University of Tokyo, JAPAN, ²Cannon Corp., JAPAN, and ³Harvard University, USA

W8G  REAL-TIME BIOCHEMICAL RESPONSE UPON CHEMICAL STIMULATION OF LIVING MONOcyTES INVESTIGATED BY FOURIER TRANSFORM INFRARED MICROSCOPY (µ-FTIR) ................................................................. 1973
G. Birarda¹,², G. Grenci³, L. Businaro³, S. Pacor¹, M. Tormen², and L. Vaccari¹
¹Elettra Synchrotron Light Laboratory, ITALY, ²Consiglio Nazionale delle Ricerche (CNR), ITALY, and
³Trieste University, ITALY
Poster Session Imaging & Detection Technologies - Electrochemical

W9G 3-D CARBON INTERDIGITATED ARRAY NANOELECTRODES FOR HIGHLY SENSITIVE SENSING OF NEUROTRANSMITTERS ................................................................. 1976
J.-I. Heo1, D.-S. Shim1, R.M. Duarte1, M. Madou2, and H. Shin1
1Ulsan National Institute of Science & Technology (UNIST), SOUTH KOREA and
2University of California, Irvine, USA

W10G INTEGRATED ELECTROCHEMICAL MICRO-SENSORS FOR METABOLISM STUDIES OF YEAST CELLS ........................................................................................................ 1979
F. Zhang1,2, J.J. Liu1, J.H. Tian1, L. Wang1, P.G. He2, and Y. Chen1,3
1École Normale Supérieure (ENS), FRANCE, 2East China Normal University, CHINA, and
3Kyoto University, JAPAN

W11G SIGNIFICANT IMPROVEMENT IN SENSITIVITY OF LEAKAGE CURRENT MICROSENSOR BY USING DENATURANT AND ELECTROLYTE-ENTRAPPING DPPC LIPOSOMES ........................................................................ 1982
P. Lorchirachoonkul1, T. Shimanouchi1, K. Yamashita1, H. Umakoshi1, R. Kuboi2, and M. Noda1
1Kyoto Institute of Technology, THAILAND and 2Osaka University, JAPAN

Poster Session Imaging & Detection Technologies - Mass Spectometry

W12G CHIP-BASED HEATERLESS NANO-APCI-MS ..................................................................................................................... 1985
R.J. Raterink, M. de Korte, H. van der Linden, and T. Hankemeier
Leiden University, THE NETHERLANDS

W13G IDENTIFYING PSA BIOMARKER WITH SOL-GEL INTEGRATED MICROARRAY AND MALDI-TOF MS ........................................................................................................... 1988
J.-Y. Ahn1, S.W. Lee2, M. Jo1, S. Ren1, J. Kang1, S. Lee1, T. Laurell2, and S. Kim1
1Dongguk University, SOUTH KOREA and 2Lund University, SWEDEN

Poster Session Imaging & Detection Technologies - Optofluidics

W14G CHARACTERIZATION OF AN OPTOFLUIDIC MICROFLOW CYTOMETER FOR SINGLE PARTICLE ANALYSIS ................................................................. 1991
M. Rosenauer and M.J. Vellekoop
Vienna University of Technology, AUSTRIA

W15G ELASTOMER MEMBRANE PRESSURE SENSORS FOR MICROFLUIDICS ......................................................................................................................... 1994
A.G. Orth, E.F. Schonbrun, and K.B. Crozier
Harvard University, USA

W16G ON-CHIP REFRACTIVE INDEX MEASUREMENT VIA INTERFACIAL REFRACTION OF TWO PHASE FLOW STREAMS ........................................................................................................ 1997
S. Xiong1,2, Y. Yang1, Y. Chen1, G.J. Zhang3, G.Q. Lo2, D.L. Kwong1, and A.Q. Liu1
1Nanyang Technological University, SINGAPORE and
2Agency for Science, Technology and Research (A*STAR), SINGAPORE

Poster Session Imaging & Detection Technologies - Others

W17G A CORONA DISCHARGE PROCESS BASED MICRO ELECTRIC NOx CONVERTER FOR THE TOTAL NOx EVALUATION IN AIR ................................................................. 2000
S.I. Yoon, Y.H. Choi, M.S. Kim, and Y.J. Kim
Yonsei University, SOUTH KOREA

W18G CHARACTERIZATION OF PDMS MICROVALVES USING MUSIC ......................................................................................................................... 2003
A.K. Au, P. Liu, and A. Folch
University of Washington, USA

W19G DETECTION OF TRACE EXPLOSIVES BY SERS USING 3-D NANOCHANNEL ARRAYS .......... 2005
K. Jiang, I. White, and D.L. DeVoe
University of Maryland, USA
W20G  **IN SITU MICRO DROPLET TYPING SYSTEM USING 3ω METHOD** ........................................... 2008
N. Yi, D. Kim, and J. Park
_Pohang University of Science and Technology (POSTECH), SOUTH KOREA_

W21G  **SAPPHIRE DIELECTRIC RESONATORS FOR MICROFLUIDIC COMPOSITIONAL ANALYSIS** ............................................................ 2011
A. Porch, A. Masood, A.J. Naylon, A. Sulaimalebbe, and D.A. Barrow
_Cardiff University, UK_

**Poster Special Focus Session - Tissue Engineering**

W1H  **BEAD-BASED RAPID CONSTRUCTION OF HETEROGENEOUS 3D TISSUE ARCHITECTURE** ............................................................... 2014
Y. Tsuda1,2, H. Onoe1, and S. Takeuchi1,2
1University of Tokyo, JAPAN and 2BEANS Project, JAPAN

W2H  **DEVELOPMENT OF INSULIN DELIVERY DEVICES COMPOSED OF LANGERHANS ISLETS AND CARDIOMYOCYTES** ........................................ 2017
H. Akaike1, Y. Tanaka1,2, Y. Sugii1,2, and T. Kitamori1,2
1University of Tokyo, JAPAN and 2Japan Science and Technology Agency (JST), JAPAN

W3H  **HIGHLY ALIGNED SKELETAL MUSCLE FIBERS** ........................................................... 2020
Y. Shimoyama, H. Onoe, Y. Tsuda, and S. Takeuchi
_University of Tokyo, JAPAN_

W4H  **MICROARRAYS FOR THE SCALABLE PRODUCTION OF UNIFORM AND METABOLICALLY RELEVANT TUMOUR SPHEROIDS** ........................................ 2023
H. Hardelauf1, J.-P. Frimat1, W. Schormann2, J.D. Stewart2, Y.-Y. Chiang3, C. Cadenas4,
J. Franzke1, J.G. Hengstler2, L.A. Kunz-Schughart1, and J. West1
1Institute for Analytical Sciences (ISAS), GERMANY, 2IfADo, GERMANY, and
3University of Dresden, GERMANY

W5H  **SCULPTING TISSUE SCAFFOLDS WITH EMBEDDED 3-D VASCULATURE** ............... 2026
J.-H. Huang, J. Kim, A. Jayaraman, and V.M. Ugaz
_Texas A&M University, USA_

W6H  **PREPARATION OF ALGINATE MICROFIBERS FOR CELL ENTRAPMENT USING A MICROFLUIDIC DEVICE** ............................................. 2029
L. Capretto1, S. Mazzitelli2, X. Zhang3, and C. Nastruzzi2
1University of Southampton, UK and 2University of Ferrara, ITALY

**Poster Special Focus Session - Electrowetting-Driven Digital Microfluidics**

W7H  **A FEEDBACK CONTROL SYSTEM FOR HIGH-FIDELITY DIGITAL MICROFLUIDICS** ........ 2032
S.C.C. Shih1, R. Fobel1, P. Kumar2, and A.R. Wheeler1
1University of Toronto, CANADA and 2Indian Institute of Technology, INDIA

W8H  **DIGITAL MICROFLUIDIC HUB FOR AUTOMATED NUCLEIC ACID SAMPLE PREPARATION** ............................................................. 2035
_Sandia National Laboratories, USA_

W9H  **MODELING THE SPONTANEOUS INSERTION OF ONE LIQUID INTO ANOTHER ON A DROPLET MICROFLUIDIC PLATFORM** ........................................... 2038
D. Chatterjee, A.K. Tucker-Schwartz, and R.L. Garrell
_University of California, Los Angeles, USA_

**Session 3A3 - Cell Analysis II**

**HIGH-DENSITY ARRAY OF SINGLE CELL TRAPS FOR HIGH-THROUGHPUT IMAGING OF CALCIUM DYNAMICS IN RESPONSE TO OXIDATIVE STRESS** .................................................. 2041
C.A. Rivet, K. Chung, M.L. Kemp, and H. Lu
_Georgia Institute of Technology, USA_
SEPARATION AND DETECTION OF RARE CELLS VIA MULTISTAGE MAGNETIC GRADIENT IN A MICROFLUIDIC DISK
National Taiwan University, TAIWAN

SICKLING RED BLOOD CELLS IN DROPLET ARRAYS
P. Abbyad1, R. Dangla1, P.-L. Tharaux2, A. Alexandrou1, and C.N. Baroud1
1Ecole Polytechnique, FRANCE and 2Paris-Cardiovascular Research Centre, FRANCE

Session 3B3 - Assays for Trauma & Disease

BURN INJURY INHIBITS NEUTROPHIL CHEMOTAXIS IN MICROFLUIDIC DEVICES
Massachusetts General Hospital, Shriners Hospital for Children and Harvard Medical School, USA

REAL TIME ELECTROCHEMICAL DNA QUANTIFICATION IN A COC LAB ON A CHIP: TOWARDS LOW-COST DIAGNOSIS OF NOSOCOMIAL INFECTIONS
V. Taniga1, G. Mottet1, S. Miserere2, L. Malaquin1, J.L. Viovy1, F. Kivlehan2, F. Mavre2, D. Marchal2, B. Limoges3, A. Le Nel1, and J. Goulpeau3
1Institut Curie, FRANCE, 2Université Paris, FRANCE, and 3FLUIGENT, FRANCE

ASSESSING THE TRAUMATIC BRAIN INJURY MARKERS S100 AND C-REACTIVE PROTEIN IN HUMAN CEREBROSPINAL FLUID VIA MICROFLUIDIC IMMUNOSUBTRACTION
A.A. Apori and A.E. Herr
University of California, Berkeley, USA

Session 3C3 - Advanced Fluid Handling

DROPS ON RAILS
R. Dangla, S. Lee, and C.N. Baroud
École Polytechnique, FRANCE

BIOLOGICALLY INSPIRED BIDIRECTIONAL FLUIDIC DIODE
H. Cho, A. Kimteng, and L.P. Lee
University of California, Berkeley, USA

ON-CHIP POROUS POLYMER MONOLITHS FOR SOLID PHASE EXTRACTION USING DIGITAL MICROFLUIDICS
H. Yang, J.M. Mudrik, M. Jebrail, and A.R. Wheeler
University of Toronto, CANADA

Session 3D3 - Nanobiotechnology Separation

SIMULTANEOUS CONCENTRATION AND SEPARATION OF PROTEINS IN NANOCHANNELS
D.W. Inglis, N. Calander, and E.M. Goldys
Macquarie University, AUSTRALIA

NANOSLINKY: DNA ENTROPOPHORESIS DOWN A NANOFLUIDIC STAIRCASE
E.A. Strychalski, S.M. Stavis, M. Gaitan, and L.E. Locascio
National Institute of Standards and Technology (NIST), USA

ORDER AND DISORDER IN NANOPOROUS MEDIA CONTROLS DNA SEPARATION EFFICIENCY
N. Nazemifard, L. Wang, W. Ye, S. Bhattacharjee, J.H. Masliyah, and D.J. Harrison
University of Alberta, CANADA
Day 4 - Thursday, 7 October 2010

Special Focus Session 4A1 - Tissue Engineering

Invited Presentation

COMPLEX TISSUE ................................................................................................................................. 2077
C.A. van Blitterswijk
University of Twente, THE NETHERLANDS

MICROFLUIDIC EXPERIMENTAL PLATFORM USING MICRO-ROTATION FLOW FOR
PRODUCING MULTIPLE SIZE-CONTROLLED THREE-DIMENSIONAL SPHEROIDS .................... 2080
H. Ota, T. Kodama, and N. Miki
Keio University, JAPAN

HIGH-THROUGHPUT SCREENING OF CELL-SURFACE TOPOGRAPHIC INTERACTIONS .......... 2083
H.V. Unadkat¹, M. Hulsman², K. Cornelissen¹, B. Papenburg¹, R.K. Truckenmüller¹, G.F. Post¹,
M. Uetz², M.J.T. Reinders², D. Stamatialis¹, C. van Blitterswijk¹, and J. de Boer¹
¹University of Twente, THE NETHERLANDS and ²Delft University of Technology, THE NETHERLANDS

Special Focus Session 4B1 - In-Line Analysis in Microreactors

Invited Presentation

IN-LINE NMR ANALYSIS USING STRIPLINE BASED DETECTORS .................................................. 2086
J. Bart¹, A.J. Oosthoek-de Vries¹, K. Tijssen¹, J.W.G. Janssen¹, P.J.M. van Bentum¹,
J.G.E. Gardeniers², and A.P.M. Kentgens¹,
¹Radboud University Nijmegen, THE NETHERLANDS and ²University of Twente, THE NETHERLANDS

AMPLIFICATION OF RNA IN GROWING AND DIVIDING MICRO-DROPLETS .............................. 2089
T. Ichii¹, H. Suzuki¹, and T. Yomo¹,²
¹Japan Science and Technology Agency (JST), JAPAN and ²Osaka University, JAPAN

EFFICIENT MICROWAVE HEATING AND DIELECTRIC CHARACTERIZATION
OF MICROFLUIDIC SYSTEMS ............................................................................................................... 2092
J. Naylon, S. Gooding, C. John, A. Morgan, O. Squires, J. Lees, D.A. Barrow, and A. Porch
Cardiff University, UK

Special Focus Session 4C1 - Electrowetting on Dielectric (EWOD)

Invited Presentation

PARALLEL PROCESSING OF MULTIFUNCTIONAL, POINT-OF-CARE
BIO-APPLICATIONS ON ELECTROWETTING CHIPS ....................................................................... 2095
R.B. Fair
Duke University, USA

AN INTEGRATED PLATFORM FOR LIGHT-INDUCED DIELECTROPHORESIS
AND ELECTROWETTING ....................................................................................................................... 2098
J.K. Valley, S.N. Pei, H.-Y. Hsu, A. Jamshidi, and M.C. Wu
University of California, Berkeley, USA

FLUID FLOW AND MIXING WITHIN DROPS IN AC ELECTROWETTING ..................................... 2101
P. Garcia-Sanchez¹, A. Ramos¹, and F. Mugele²
¹University of Sevilla, SPAIN and ²University of Twente, THE NETHERLANDS

Special Focus Session 4D1 - Business with Microfluidics

Invited Presentation

THE JOURNEY OF ÅMIC .......................................................................................................................... 2104
O. Öhman
Meje AB, SWEDEN
Invited Presentation

A PREFILLED, READY-TO-USE, ELECTROPHORESIS-BASED LAB-ON-A-CHIP DEVICE FOR MONITORING IONS IN BLOOD AND URINE

S.S. Staal¹, J. Floris¹, S.O. Lenk¹, E. Staijen¹, M. Avilla Muñoz², D. Kohlheyer¹, J.C.T. Eijkel¹, and A. van den Berg³

¹Medimate BV, THE NETHERLANDS, ²University of Castilla-La Mancha, SPAIN, and ³MESA+, University of Twente, THEN NETHERLANDS

Invited Presentation

VALUE CREATION BASED ON HIGH TECH

J. Elders

Thermo Fisher Scientific, THE NETHERLANDS

Session 4A2 - Tissue Models and Analysis

MICROFLUIDIC INTERFACE DEVICES FOR IN VIVO ANALYSIS OF NEURAL CELLS USING 2-PHOTON LASER SCANNING MICROSCOPY


University of Tokyo, JAPAN

PERFUSION-BASED MICROFLUIDIC DEVICE FOR THREE-DIMENSIONAL DYNAMIC PRIMARY HUMAN HEPATOCYTE CELL CULTURE IN THE ABSENCE OF BIOLOGICAL OR SYNTHETIC MATRICES OR COAGULANTS

V.N. Goral¹, Y.-C. Hsieh², O.N. Petzold¹, J.S. Clark¹, P.K. Yuen¹, and R.A. Faris¹

¹Corning Incorporated, USA and ²Corning Research Center, TAIWAN

FINE REGULATION OF POLARITY IN A HEPATOCYTE CULTURE UTILIZING OXYGEN-PERMEABLE MEMBRANES AND MICROPATTERNED COLLAGEN GEL

H. Matsui¹, H. Kimura³, T. Osada³, M. Sekijima¹, T. Fujii², S. Takeuchi², and Y. Sakai²

¹BEANS Laboratory, JAPAN, ²University of Tokyo, JAPAN, and ³Mitsubishi Chemical Medience Co. Ltd., JAPAN

Session 4B2 - Chemistry at "Small Scale"

USING STRUCTURED MICROFLOWS TO SYNTHESIZE FUNCTIONAL PARTICLES

K.W. Bong, K.T. Bong, D.C. Pregibon, and P.S. Doyle

Massachusetts Institute of Technology, USA

SONOCHEMICAL MICROREACTOR WITH MICROBUBBLES CREATED ON MICROMACHINED SURFACES

D. Fernandez Rivas¹, A.G. Zijlstra³, A. Prosperetti¹,², D. Lohse¹, and J.G.E. Gardeniers¹

¹MESA+, University of Twente, THE NETHERLANDS and ²Johns Hopkins University, USA

CHAOTICALLY ACCELERATED BIOCHEMISTRY IN MICROSCALE CONVECTIVE FLOWS

R. Muddu, Y.A. Hassan, and V.M. Ugaz

Texas A&M University, USA

Session 4C2 - Cell Encapsulation in Droplets

A PULSE LASER-DRIVEN MICROFLUIDIC DEVICE FOR ULTRA-FAST DROPLET GENERATION ON DEMAND AND SINGLE-CELLS ENCAPSULATION

S.Y. Park¹, T.H. Wu¹, Y. Chen¹, S. Nisperos², J. Zhong², and P.-Y. Chiu¹

¹University of California, Los Angeles, USA and ²University of Southern California, USA

MICROFLUIDIC DEVICE FOR SINGLE-CELL ENCAPSULATION BY RANDOM BREAKUP AND SORTING OF MICRO-DROPLETS

E. Um and J.-K. Park

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

HIGH EFFICIENCY CELL ENCAPSULATION UTILIZING NOVEL ON-DEMAND DROPLET GENERATION SCHEME AND IMPEDANCE-BASED DETECTION

R. Lin, J.-L. Prieto, J.S. Fisher, and A.P. Lee

University of California, Irvine, USA
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PHONONIC CRYSTAL METAMATERIALS FOR FREQUENCY TUNABLE MICROFLUIDIC FUNCTIONS USING SURFACE ACOUSTIC WAVES ........................................ 2138
J. Reboud, R. Wilson, Y. Bourquin, Y. Zhang, S.L. Neale, and J.M. Cooper
University of Glasgow, UK

DYNAMIC PICO-LITER BUBBLE MANIPULATION VIA TIOPC-BASED LIGHT-INDUCED DIELECTROPHORESIS ........................................................... 2141
S.-M. Yang¹, T.-M. Yu¹, H.-P. Huang¹, H.-P. Chen², L. Hsu¹, and C.-H. Liu²
¹National Chiao Tung University, TAIWAN and ²National Tsing Hua University, TAIWAN