



Preliminary Program

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

Wednesday - April 10, 2013

- 08:30** **Welcome and Introduction**
Ellis Meng, *University of Southern California, USA*
- 08:55** **Keynote Speaker I**
- W1K.1** **SENSORY CONTROL OF STANDING AND STEPPING ENABLED BY EPIDURAL STIMULATION AFTER A HUMAN MOTOR COMPLETE SPINAL CORD INJURY**
S. Harkema
University of Louisville, USA
- 09:45** **Break**
- 10:15** **Flash Poster Session 1 - Microtechnology Advances**
- W2P.01** **A HYBRID PIEZO-MAGNETIC TWEEZER WITH SILICON FINGER TIPS INTENDED FOR BIO SAMPLES MANIPULATION**
I.A. Ivan^{1,2}, M.N. Ardeleanu¹, I.V. Gurgu¹, V. Despa¹, and J. Agnus²
¹Valahia University of Targoviste, ROMANIA and ²FEMTO-ST Institute, FRANCE
- W2P.02** **A MICROFLUIDIC DEVICE FOR CELL-BASED DRUG TESTING UNDER A CHEMICAL AND OXYGEN GRADIENT COMBINATION**
Y.-J. Cheng¹, M. Tu², Y.-H. Chen¹, C.-C. Peng¹, and Y.-C. Tung¹
¹Academia Sinica, TAIWAN and ²Princeton University, USA
- W2P.03** **A NOVEL SMEA DESIGN FOR DIRECTIONAL STRETCHING OF CELLS**
S. Khoshfetrat Pakazad¹, A. Savov¹, A. van de Stolpe², and R. Dekker^{1,2}
¹Delft University of Technology, THE NETHERLANDS and ²Philips Research, THE NETHERLANDS
- W2P.04** **ACTIVE SIZE CONTROLLED DROPLET GENERATION DEVICE USING HORIZONTAL PNEUMATIC MICROVALVES**
A. Jamshaid, D.H. Yoon, T. Sekiguchi, and S. Shoji
Waseda University, JAPAN
- W2P.05** **ALD-ASSISTED PASSIVATION TECHNOLOGY FOR BIOFILM STUDIES IN MICROFLUIDICS**
M.T. Meyer, Y.W. Kim, H. Ben-Yoav, M. Gnerlich, and R. Ghodssi
University of Maryland, USA
- W2P.06** **ALL-DIRECTIONAL BENDING OF TUBULAR STRUCTURES BY MICRO ACTUATORS BASED ON THE BOWDEN PRINCIPLE**
K. Kaiser¹, D. Schetelig¹, T. Zehlicke², and J. Müller¹
¹Hamburg University of Technology (TUHH), GERMANY and ²German Army Hospital of Hamburg, GERMANY
- W2P.07** **AUTOMATED AND RAPID LABELING OF CELLS FOR FLOW CYTOMETRY USING MICROFLUIDICS**
R. Estrada, P.K. Patibandla, M. Kannan, and P. Sethu
University of Louisville, USA

- W2P.08** **CAVITATION MICROSTREAMING AND ITS APPLICATION TO CELL/PARTICLE SEPARATION WITH ON-CHIP PUMPING**
M.V. Patel, A. Doria, and A.P. Lee
University of California, Irvine, USA
- W2P.09** **FLEXIBLE MICROFLUIDIC ON-DEMAND DROPLET GENERATION FOR SINGLE CELL ENCAPSULATION AND ISOLATED AMPLIFICATION**
M. Rhee, P. Liu, Y.K. Light, S. Yilmaz, J. Sustarich, R.J. Meagher, and A.K. Singh
Sandia National Laboratories, USA
- W2P.10** **GROWTH CONTROL OF BACTERIAL MAGNETIC NANOPARTICLES LOADED CELLS WITH AN EXTERNAL MAGNETIC FIELD**
J. Shin, S. Lee, M. Cha, and J. Lee
Seoul National University, SOUTH KOREA
- W2P.11** **MAGNETICALLY-ACTUATED PICOLITER REACTOR ARRAY**
P.J. Chang¹, M.C. Yuen¹, R.P. Otilar², S. Deutsch², and D.A. Horsley¹
¹University of California, Davis, USA and ²Lawrence Berkeley National Laboratories, USA
- W2P.12** **MICROFLUIDIC PERFUSION DEVICES FOR LONG-TERM CELL CULTURE, MICROELECTRODE ARRAY ELECTROPHYSIOLOGY AND TIME LAPSE IMAGING AT AMBIENT CONDITIONS**
D. Saalfrank^{1,2}, R. Habibey¹, A. Golabchi¹, M. Nanni¹, F. Succol¹, S. Ingebrandt², and A. Blau¹
¹Istituto Italiano di Tecnologia (IIT), ITALY and ²University of Applied Sciences Kaiserslautern, GERMANY
- W2P.13** **MICROFLUIDIC SONOLUMINESCENT UV LIGHT SOURCE**
R. Surapaneni, P. Pai, R.E. Fernandez, M. Tabib-Azar, and C.H. Mastrangelo
University of Utah, USA
- W2P.14** **OPERATIONAL FACTORS AFFECTING PERFORMANCE OF MEMS-BASED ULTRAHIGH THROUGHPUT MECHANOPORATION DEVICES**
Y. Zhang¹, D. Nampe¹, H. Dixit¹, C.B. Ballas², H. Tsutsui¹, and M.P. Rao¹
¹University of California, Riverside, USA and ²Cook Biotech, USA
- W2P.15** **PERFORMANCE OF GOLD NANOPARTICLE COATINGS AS THERMAL ABSORBERS FOR BIOMEMS APPLICATIONS**
T.M. Lucas, E.V. Moiseeva, and C.K. Harnett
University of Louisville, USA
- W2P.16** **RAPIDLY ADAPTING MECHANORECEPTOR-INSPIRED TRANSDUCER WITH ALL-OPTOFLUIDIC REALIZATION OF SELF-DIGITIZATION AND PULSE CODE MODULATION**
J. Paek, J. Lee, and J. Kim
Iowa State University, USA
- W2P.17** **ROLLING CIRCLE AMPLIFICATION (RCA) OF TARGET DNA AND ITS LABEL FREE DETECTION BY SILICON NANOTWEEZERS**
M. Kumemura¹, S.L. Karsten², D. Collard¹, N. Lafitte¹, L. Jalabert¹, and H. Fujita¹
¹University of Tokyo, JAPAN and ²NeuroInDx. Inc., USA
- W2P.18** **SINGLE DNA MOLECULE ANALYSIS IN SELF-ASSEMBLED NANOWIRE ARRAY CHIPS**
T. Yasui¹, S. Rahong², T. Yanagida², N. Kaji¹, M. Kanai², K. Nagashima², K. Doi², M. Tokeshi^{1,3}, S. Kawano², T. Kawai², and Y. Baba^{1,2,4}
¹Nagoya University, JAPAN, ²Osaka University, JAPAN, ³Hokkaido University, JAPAN, and ⁴National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

- W2P.19** **STRETCHABLE, CONFORMAL MICROELECTRODE ARRAY FABRICATED WITH PATTERNED FLEX CIRCUIT TECHNOLOGY**
R.E. Taylor¹, C.M. Boyce², M.C. Boyce^{2,3}, and B.L. Pruitt¹
¹Stanford University, USA, ²Infinite Corridor Technology, USA, and
³Massachusetts Institute of Technology, USA
- W2P.20** **TITANIUM DIOXIDE NANOTUBE BASED SENSING PLATFORM FOR RAPID DETECTION OF TUBERCULOSIS DERIVED VOLATILE ORGANIC COMPOUNDS**
Y. Kim, M. Misra, and S.K. Mohanty
University of Utah, USA
- 10:45** **W2P – Poster Session 1**
- 12:15** **Lunch**
- 13:45** **Flash Poster Session 2 - Microtechnologies & Applications**
- W3P.01** **3D FABRICATION OF MICRO-AND NANOSTRUCTURES BY CORNER LITHOGRAPHY**
J.W. Berenschot¹, N. Burouni¹, E. Sarajlic², H.V. Jansen¹, A.A. van Apeldoorn¹, and N.R. Tas¹
¹University of Twente, THE NETHERLANDS and ²SmartTip B.V., THE NETHERLANDS
- W3P.02** **3D STRUCTURES IN APEX GLASS FOR ELECTRONIC PACKAGING AND BIOLOGICAL ASSAY APPLICATIONS**
J.H. Flemming¹, R. Cook¹, and E. Weaver²
¹3D Glass Solutions, USA and ²Life BioScience, Inc., USA
- W3P.03** **A NOVEL TECHNIQUE FOR FABRICATION OF DISSOLVABLE MICRONEEDLE ARRAYS**
E. Korkmaz¹, B. Bediz¹, R. Khilwani¹, G. Erdos², L.D. Falo Jr.², and O.B. Ozdoganlar¹
¹Carnegie Mellon University, USA and ²University of Pittsburgh School of Medicine, USA
- W3P.04** **A REAL TIME IMAGING SYSTEM FOR TRACKING FREELY MOVING C. ELEGANS FOR TOUCH ASSAYS**
E.A. Mazzochette¹, C. Fang-Yen², M.B. Goodman¹, and B.L. Pruitt¹
¹Stanford University, USA and ²University of Pennsylvania, USA
- W3P.05** **A SINGLE COMB-LIKE ELECTRODE ARRAY FOR HIGHLY SENSITIVE ELECTROCHEMICAL DETECTION OF CATECHOLAMINE IN MICROFLUIDIC DEVICE**
J. Sekiya, T. Tanaka, S. Yokogawa, A. Ishida, H. Tani, and M. Tokeshi
Hokkaido University, JAPAN
- W3P.06** **ARRAYED 3D PARYLENE SHEATH PROBES FOR NEURAL RECORDINGS**
J.T.W. Kuo¹, B.J. Kim¹, S.A. Hara¹, C.D. Lee¹, L. Yu¹, C.A. Gutierrez²,
T.Q. Hoang¹, and E. Meng¹
¹University of Southern California, USA and ²Independent Consultant, USA
- W3P.07** **AUTOMATED ON-CHIP ISOLATION AND DETECTION OF EXOSOMES USING RAPID INERTIAL SOLUTION EXCHANGE**
J.S. Dudani, D.R. Gossett, H.T.K. Tse, R. Kulkarni, R.J. Lamm, and D. Di Carlo
University of California, Los Angeles, USA

- W3P.08** **A CONTINUOUS FLOW REAL TIME PCR INSTRUMENT FOR FIELD-DEPLOYABLE ENVIRONMENTAL SAMPLE ANALYSES**
T. Ray, A. Hatch, K. Lintecum, S.-H. Chao, and C. Youngbull
Arizona State University, USA
- W3P.09** **DEVELOPMENT OF A REAL-WORLD TO CHIP INTERFACE FOR THE EXTRACTION OF NUCLEIC ACIDS FROM URINE, BASED ON A DUAL-PHASE POROUS SILICA MONOLITHIC STRUCTURE**
C. Birch, M. Nasr Esfahani, S.J. Haswell, and C.E. Dyer
University of Hull, UK
- W3P.10** **DISPERSION OF A NANOLITER BOLUS IN MICROFLUIDIC CO-FLOW**
A. Conway¹, W. Saadi¹, G. Kowalski², D. Larson¹, and J. Fiering¹
¹Charles Stark Draper Laboratory, USA and ²Northeastern University, USA
- W3P.11** **ELECTRIC IMPEDANCE MEASUREMENT IN A MICROFLUIDIC TRAP STRUCTURE USING INTEGRATED ELECTRODES**
A. El Hasni and U. Schnakenberg
RWTH Aachen University, GERMANY
- W3P.12** **FABRICATION AND APPLICATIONS OF LAMINATED PAPER-BASED ANALYTICAL DEVICES (LPAD)**
C.L. Cassano¹, W. Liu^{1,2}, and Z.H. Fan¹
¹University of Florida, USA and ²Shaanxi Normal University, CHINA
- W3P.13** **FLUORESCENCE CONFINEMENT FOR IMPROVED MICROARRAY READOUT**
S. Dobroiu¹, J. Aveyard¹, F. van Delft², and D. Nicolau¹
¹University of Liverpool, UK and ²Philips Research Europe, THE NETHERLANDS
- W3P.14** **IMAGING SULFIDE IONS IN RAT'S BRAIN BY DROPLET-BASED MICROCHIP COMBINED WITH MICRODIALYSIS**
X. Zhu and M. Zhao
Peking University, CHINA
- W3P.15** **INERTIAL EFFECTS ON STOKES DRIFT PARTICLE MOTION IN HYDRODYNAMIC TWEEZER MICROFLUIDIC FLOWS**
T.A. House and D.T. Schwartz
University of Washington, USA
- W3P.16** **LABEL-FREE CHARACTERIZATION OF RARE CELLS**
S.M. Crippen¹, J.I. Padovani¹, M.L. Honrado², S.S. Jeffrey¹, and R.T. Howe¹
¹Stanford University, USA and ²San Jose State University, USA
- W3P.17** **MICROFLUIDIC DEVICE FOR GLYCATED HEMOGLOBIN MEASUREMENT BASED ON CAPILLARY ELECTROPHORESIS**
A. Shin, M.J. Park, M.S. Lee, K.C. Lee, S.J. Ku, and M.C. Paek
Korea Material & Analysis Corporation (K-MAC), SOUTH KOREA
- W3P.18** **MULTI-USE, WIREBONDED HELMHOLTZ PROBE FOR NUCLEAR MAGNETIC RESONANCE MICROSCOPY AND SPECTROSCOPY**
N. Spengler, R.Ch. Meier, A. Moazenzadeh, V. Badilita, J.G. Korvink, and U. Wallrabe
University of Freiburg, GERMANY
- W3P.19** **NOVEL APPROACH TOWARDS TRAPPING AND IMAGING OF INDIVIDUAL MITOCHONDRIA**
K. Zand¹, T. Pham¹, A. Davila, Jr², D.C. Wallace², and P. Burke¹
¹University of California, Irvine, USA and ²University of Pennsylvania, USA

- W3P.20** **SIMULATION STUDY OF ROTATIONAL ELECTRIC FIELD ON SPHERICAL PARTICLES FOR ELECTROROTATION STUDIES**
P. Benhal¹, J.G. Chase¹, W. Wang², P. Gaynor², and B. Oback³
¹University of Canterbury, NEW ZEALAND, ²AgResearch Ruakura Research Centre, NEW ZEALAND,
³MacDiarmid Institute for Advanced Materials and Nanotechnology, NEW ZEALAND,
⁴Tsinghua University, CHINA
- W3P.21** **SPHERICAL PRESSURE SENSING MICROPARTICLES FOR 3D PRESSURE FIELD MAPPING**
N. Banerjee, Y. Xie, and C. Mastrangelo
University of Utah, USA
- W3P.22** **ON-BOARD MIXING PERFORMANCE USING A SIMPLE BELLOWS PNEUMATIC PUMP**
P.S. Ehrlich, J. Podczerviensky, and L.M. Levine
ALine, Inc, USA
- W3P.23** **PRODUCTION OF HIGH YIELD GOLD/GOLD-SULFIDE NANOPARTICLES VIA CELLULOSE MEMBRANE**
K. James, D. Patel, A.M. Gobin, and R. Keynton
University of Louisville, USA
- 14:15** **W3P – Poster Session 2**
- 15:45** **Keynote Speaker II**
- W4K.2** **BUILDING TISSUE HIGH THROUGHPUT**
C.A. van Blitterswijk
University of Twente, THE NETHERLANDS
- 17:00 - 18:30** **Wine & Cheese Reception (Wednesday Award Ceremony)**

Thursday, April 11, 2013

08:30 Keynote Speaker III

T1K.3 BUILDING MOLECULES TO IMAGE AND TREAT DISEASE
Q.T. Nguyen, E.S. Olson, T.A. Aguilera, T. Jiang, M. Whitney, J.L. Crisp,
E. Savariar, P. Steinbach, L. Ellies, and **R.Y. Tsien**
University of California, San Diego, USA

09:20 Break

09:50 Flash Poster Session 3 - Biotechnology Applications

T2P.01 A FERROFLUID-BASED PRESSURE SENSOR FOR BIOMEDICAL APPLICATIONS
G. Chitnis and B. Ziaie
Purdue University, USA

T2P.02 A LOW-COST OXYGEN SENSOR ON PAPER FOR MONITORING WOUND OXYGENATION
R. Rahimi¹, G. Chitnis¹, P. Mostafalu², M. Ochoa¹, S. Sonkusale², and B. Ziaie¹
¹Purdue University, USA and ²Tufts University, USA

T2P.03 A MEMS MICROPUMP SYSTEM WITH ONE-WAY VALVE FOR CHRONIC DRUG DELIVERY
H.M. Gensler, R. Sheybani, and E. Meng
University of Southern California, USA

T2P.04 A MICROFLUIDIC PAPER-BASED ELECTROCHEMICAL SENSOR ARRAY FOR MULTIPLEXED DISEASE-MARKER DETECTION
C. Zhao and X. Liu
McGill University, CANADA

T2P.05 A SYNTHETIC HYDROGEL BASED STRATEGY TO ACHIEVE CONTINUOUS AND SELF-REGULATED DELIVERY OF INSULIN
A. Matsumoto¹, T. Ishii², K. Kataoka², and Y. Miyahara¹
¹Tokyo Medical and Dental University, JAPAN and ²University of Tokyo, JAPAN

T2P.06 AN ENHANCED BACTERIAL BIOFILM TREATMENT USING SUPERPOSITIONED ELECTRIC FIELD
Y.W. Kim, H. Ben-Yoav, H.C. Wu, D. Quan, K. Carter, M.T. Meyer, W.E. Bentley, and R. Ghodssi
University of Maryland, USA

T2P.07 CHARACTERIZATION OF WAX EXPANSION AND CAPILLARY WICKING FOR PAPER-BASED MICROFLUIDICS
C. Castro, C. Rosillo, J. Yoo, and H. Tsutsui
University of California, Riverside, USA

T2P.08 CLOSED-LOOP ON-DEMAND DRUG DELIVERY MICROPUMP FOR CHRONIC PAIN MANAGEMENT APPLICATIONS
R. Sheybani, S. Elyahoodayan, and E. Meng
University of Southern California, USA

- T2P.09 CONTACTLESS IMPEDANCE SENSING: LOW COST CELLOMIC AND PROTEOMICS FOR THE DEVELOPING WORLD**
M. Javanmard, S. Emaminejad, R. Dutton, and R.W. Davis
Stanford University, USA
- T2P.10 DRUG-LOADED MC-1 MAGNETOTACTIC BACTERIA DESIGNED TO TREAT COLORECTAL CANCER**
S. Martel
University of Montréal, CANADA
- T2P.11 DUAL-SIDED POLYIMIDE ELECTRODE ARRAYS FOR NEURAL RECORDING AND STIMULATION**
S.H. Felix, A.C. Tooker, V.M. Tolosa, H.J. Sheth, K.G. Shah, T.L. Delima, and S.S. Pannu
Lawrence Livermore National Laboratory, USA
- T2P.12 ELECTROCHEMICAL CHARACTERIZATION OF A 3D PARYLENE SHEATH CORTICAL PROBE**
S.A. Hara¹, J.T.W. Kuo¹, B.J. Kim¹, C.D. Lee¹, L. Yu¹, C.A. Gutierrez², T.Q. Hoang¹, and E. Meng¹
¹*University of Southern California, USA and* ²*Independent Consultant, USA*
- T2P.13 FABRICATION OF DISSOLVABLE MICRO-NEEDLES FOR DELIVERING FLEXIBLE NEURAL PROBES**
R. Khilwani, P.K. Gunalan, P.J. Gilgunn, G.K. Fedder, and O.B. Ozdoganlar
Carnegie Mellon University, USA
- T2P.14 HIGH QUALITY FACTOR RESONANT MICROSENSOR PLATFORM FOR BIO-FLUID MEASUREMENTS**
J.M. Gonzales and R. Abdolvand
Oklahoma State University, USA
- T2P.15 IMPLEMENTATION OF ISOTACHOPHORESIS IN A MICROFLUIDIC DEVICE FOR THE ENHANCEMENT OF PROTEIN IMMUNOASSAYS**
R. Khnouf¹, G. Goet², and S. Hardt²
¹*Jordan University of Science and Technology, JORDAN and* ²*Technische Universität Darmstadt, GERMANY*
- T2P.16 IN VITRO CHARACTERIZATION OF A PROBE-MOUNTED PARYLENE-BASED PRESSURE SENSOR ARRAY FOR INTRACORTICAL APPLICATIONS**
B.J. Kim¹, C.A. Gutierrez², and E. Meng¹
¹*University of Southern California, USA and* ²*Independent Consultant, USA*
- T2P.17 MICROFABRICATED FILTERS FOR EFFICIENT ISOLATION AND ANALYSIS OF CIRCULATING TUMOR CELLS**
O.V. Makarova¹, D. Adams¹, P. Zhu¹, R. Divan², S. Martin³, M. Charpentier³, K. Alpaugh⁴, S. Li¹, P. Amstutz¹, and C.-M. Tang¹
¹*Creatv MicroTech Inc., USA,* ²*Argonne National Laboratory, USA,* ³*University of Maryland School of Medicine, USA and* ⁴*Fox Chase Cancer Center, USA*
- T2P.18 MICROFLUIDIC-SERS CYTOMETRY PLATFORM FOR CANCER CELL IDENTIFICATION**
A. Pallaoro¹, M.R. Hoonejani¹, G.B. Braun², M. Moskovits¹, and C. Meinhart¹
¹*University of California, Santa Barbara, USA and* ²*Stanford-Burnham Medical Research Institute, USA*

- T2P.19** **MICROPALPATION ANALYSIS FOR SURGERY NAVIGATION:
DEFINING TUMOR MARGINS BY IDENTIFYING
VISCOELASTIC TISSUE PROPERTIES**
V.A. Sadovnichii¹, I.P. Prikhodko², M.E. Sokolov¹, and A.Z. Radovic³
¹Moscow State University, RUSSIA, ²University of California, Irvine, USA, and
³National University and St. Katherine College, USA
- T2P.20** **MICROSCALE CULTURE AND COCULTURE PLATFORM
FOR BOTULINUM NEUROTOXIN DETECTION**
W. Hong, E. Young, W. Tepp, E. Johnson, and D. Beebe
University of Wisconsin, Madison, USA
- T2P.21** **A MODULAR EMBEDDED SYSTEM DESIGN FOR IMPLANTABLE
WIRELESS BLADDER PRESSURE SENSING**
S.S. Lee¹, A. Kim¹, G. Chitnis¹, C.R. Powell², and B. Ziaie¹
¹Purdue University, USA and ²Indiana University School of Medicine, USA
- T2P.22** **MOLECULAR RECOGNITION BY BORONIC ACID DERIVATIVE
FOR EFFECTIVE PYROPHOSPHATE CHEMOSENSING**
M. Sanjoh, A. Matsumoto, and Y. Miyahara
Tokyo Medical and Dental University, JAPAN
- T2P.23** **MULTISTAGE HUMAN HEAT POWERED KNUDSEN PUMP FOR
USE IN A WEARABLE INFUSION PUMP**
A.D. Bell and S. McNamara
University of Louisville, USA
- T2P.24** **NOVEL HEATING AND COOLING TECHNIQUES ON A CENTRIFUGAL
FLUIDIC PLATFORM FOR POLYMERASE CHAIN REACTION**
L. Kong¹, J.M. Rodriguez², A. Perebikovskiy¹, J. Moebius¹, R. Mitchell¹, L. Kulinsky¹, and M. Madou¹
¹University of California, Irvine, USA and ²Tecnológico de Monterrey, MEXICO
- T2P.25** **PHOTOLITHOGRAPHIC BIO-PATTERNING OF MAGNETIC
SENSORS FOR BIOMOLECULAR RECOGNITION**
E. Albisetti¹, D. Petti¹, F. Damin², M. Cretich², M. Bagnati², L. Sola², M. Chiari², and R. Bertacco¹
¹LNESS - Politecnico di Milano, ITALY and ²ICRM-CNR, ITALY
- T2P.26** **PLASMONIC FLOW-THROUGH BIOSENSOR USING A POLYMERIC SUBSTRATE**
A. Buchenauer¹, M. Bialon¹, D. Segun¹, W.T.V. Germeraad², and U. Schnakenberg¹
¹RWTH Aachen University, GERMANY and
²Maastricht University Medical Center, THE NETHERLANDS
- T2P.27** **POLYMERASE CHAIN REACTION AT HOME MADE REAL-TIME
POLYMERASE CHAIN REACTION MACHINE**
J.S. Wang, T.T. Dow, and Y.C. Hu
National Applied Research Laboratories, TAIWAN
- T2P.28** **PROGRAMMABLE MICROFLUIDIC SYSTEM FOR
RECIPROCATING DRUG DELIVERY TO THE COCHLEA**
J. Fiering¹, E.S. Kim¹, E.E. Pararas¹, A.J. Spencer¹, K.A. Smith¹, M.J. Mescher¹,
W.F. Sewell², M.J. McKenna², W. Kang², S.G. Kujawa², and J.T. Borenstein¹
¹Charles Stark Draper Laboratory, USA and ²Massachusetts Eye and Ear Infirmary, USA
- T2P.29** **SAP AS DIGITAL PCR BIOREACTORS**
P. Satsanarukkit¹ and J.J. van Zyl²
¹California Institute of Technology, USA and ²Jet Propulsion Lab, USA

- T2P.30** **TOWARDS A HIGH THROUGHPUT DROPLET-BASED AGGLUTINATION ASSAY**
R. Kodzius, D. Castro, and I.G. Foulds
King Abdullah University of Science & Technology, SAUDI ARABIA
- 10:25** **T2P - Poster Session 3**
- 11:55** **Lunch**
- 13:25** **Flash Poster Session 4 - Cell Molecular Biology**
- T3P.01** **A CRYOGENIC PHOTO-CHEMICAL DNA SYNTHESIS PROTOCOL
WITH INCREASED OLIGONUCLEOTIDE YIELD**
S.S. Pandey, R.E. Fernandez, and C.H. Mastrangelo
University of Utah, USA
- T3P.02** **A MICROFLUIDIC CHIP FOR IMPEDANCE ANALYSIS AND
CHARACTERIZATION OF HUMAN UMBILICAL VEIN
ENDOTHELIAL CELLS UNDER FLUID SHEAR STRESS**
V. Velasco, S.J. Williams, and R. Keynton
University of Louisville, USA
- T3P.03** **ARRAYING *DROSOPHILA MELANOGASTER* EMBRYOS BY
TEMPLATE-ASSISTED SELF-ASSEMBLY AND SUCTION POSITIONING**
K. Turner, A. Tamayol, A.M. Rafiqi, L.A. Nilson, E. Abouheif, and D. Juncker
McGill University, CANADA
- T3P.04** **BIOMECHANICAL MEASUREMENT OF DNA DEGRADATION
UNDER THERAPEUTIC RADIATION BEAMS BY SILICON
NANOTWEEZERS AND ASSOCIATED FLUIDIC CAVITY**
G. Perret^{1,3}, T. Lacornerie², M. Kumemura¹, N. Lafitte¹, H. Guilou¹, L. Jalabert¹,
E. Lartigau², T. Fujii¹, F. Cleri³, H. Fujita¹, and D. Collard¹
¹University of Tokyo, JAPAN, ¹University of Lille 2, FRANCE and ²University of Lille 1, FRANCE
- T3P.05** **CELL-BASED MULTIPARAMETRIC BIOSENSOR WITH CAPABILITIES
OF RAPID AND SENSITIVE WATER TOXICITY DETECTION**
F. Liu¹, F. Li², A. Nordin³, and I. Voiculescu¹
*¹City College of New York, USA, ²New York Institute of Technology, USA, and
³International Islamic University, Malaysia, MALAYSIA*
- T3P.06** **CHARACTERIZATION OF SHEAR-INDUCED PERPENDICULAR ALIGNMENT
OF ENDOTHELIAL CELLS IN MICROFLUIDIC CHANNELS**
S. Srigunapalan, J. Han, J. Brunetti, L.L. Caruso, V. Bianchi, E.W.K. Young, A.P. McGuigan,
A.R. Wheeler, and C.A. Simmons
University of Toronto, CANADA
- T3P.07** **COMPARATIVE ENDOTHELIAL CELL ADHESION, PROLIFERATION, &
MORPHOLOGY ON MICRO- & NANOPATTERNED TITANIUM & SILICON**
P. Vandurangi, S.C. Gott, V.G.J. Rodgers, and M.P. Rao
University of California, Riverside, USA

- T3P.08** **CONCURRENT TRANSCRIPT AND PROTEIN QUANTIFICATION IN MASSIVE SINGLE CELL ARRAYS**
S.-M. Park¹, J.Y. Lee¹, S. Hong¹, I.K. Dimov^{1,2}, S.H. Lee¹, Q. Pan¹, K. Li³, A.M. Wu³, S. Mumenthaler⁴, P. Mallick², and L.P. Lee¹
¹University of California, Berkeley, USA, ²Stanford University, USA,
³University of California, Los Angeles, USA, and ⁴University of Southern California, USA
- T3P.09** **IMPEDANCE BIOSENSOR DETECTING ANTIGEN – ANTIBODY INTERACTION**
J. Lazar¹, A. Buchenauer¹, M. Bialon¹, D. Segun¹, W.T.V. Germeraad², and U. Schnakenberg¹
¹RWTH Aachen University, GERMANY and
²Maastricht University Medical Center, THE NETHERLANDS
- T3P.10** **INDUCING VARIATIONS IN THE SHORTENING OF SINGLE CARDIOMYOCYTES WITH LOCALIZED MECHANICAL STIMULATION**
G.C. Higgs, A.J.S. Ribeiro, K. Zaleta, E.A. Ashley, and B.L. Pruitt
Stanford University, USA
- T3P.11** **MECHANO-ACTUATED CA²⁺ TRANSIT ON A MICROFLUIDIC DEVICE REVEALS SPATIAL AND TEMPORAL CHARACTERISTICS**
F. Kurth, S.K. Kuester, A. Franco-Obregón, and P.S. Dittrich
ETH Zurich, SWITZERLAND
- T3P.12** **MULTIPLEXED IMMUNO-FLUORESCENCE WITH DYNAMIC DNA PROBES**
E.B. Samson, J. Zimak, V. Schweikthard, and M. Diehl
Rice University, USA
- T3P.13** **NANOENGINEERED PROBES FOR MONITORING SINGLE CELL RESPONSES DURING INJURY INDUCED COLLECTIVE CELL MIGRATION**
R. Riahi, D.D. Zhang, and P.K. Wong
University of Arizona, USA
- T3P.14** **PATTERNING AND TRANSFERRING HYDROGEL-ENCAPSULATED SYNTHETIC BACTERIAL CELLS FOR QUANTIFICATION AND BIOSENSOR-APPLICATION OF GENETIC CIRCUITS**
T. Kim, W.S. Choi, M. Kim, and S.-K. Lee
Ulsan National Institute of Science and Technology (UNIST), SOUTH KOREA
- T3P.15** **REAL-TIME FORCE MEASUREMENT OF CELL-GENERATED FORCES DURING BACTERIAL PHAGOCYTOSIS**
J. Möller^{1,2}, J.C. Doll², M.A. Hopcroft³, E.A. Mazzoquette², K.-W. Jung², V. Vogel¹, and B.L. Pruitt²
¹ETH Zurich, SWITZERLAND, ²Stanford University, USA, and
³Hewlett-Packard Laboratories, USA
- T3P.16** **A SINGLE COMB-LIKE ELECTRODE ARRAY FOR HIGHLY SENSITIVE ELECTROCHEMICAL DETECTION OF CATECHOLAMINE IN MICROFLUIDIC DEVICE**
J. Sekiya, T. Tanaka, S. Yokogawa, A. Ishida, H. Tani, and M. Tokeshi
Hokkaido University, JAPAN
- T3P.17** **DETECTION OF TAU PROTEINS THROUGH MICROTUBULE GLIDING**
T. Ikeuchi¹, S.P. Subhathirai¹, M.C. Tarhan², S.L. Karsten³, H. Fujita², H. Shintaku¹, H. Kotera¹, and R. Yokokawa¹
¹Kyoto University, JAPAN, ²University of Tokyo, JAPAN, and ³NeuroInDx Inc., USA
- T3P.18** **ENERGY HARVESTING FROM GASTRIC ACID FOR ENDOSCOPY APPLICATION**
P. Mostafalu and S. Sonkusale
Tufts University, USA

- T3P.19** **ENHANCEMENT OF GOLD NANOSHELLS FOR DETECTION OF BIOMARKERS USING A SANDWICH ELISA SYSTEM**
D. Patel, G. Zhang, X. Sun, M. O'Toole, A. Gobin, and R. Keynton
University of Louisville, USA
- T3P.20** **MICROTUBULE BASED TAU BIOSENSOR AS A FUTURE DIAGNOSTIC TOOL FOR TAUOPATHIES**
M.C. Tarhan¹, Y. Orazov¹, R. Yokokawa², S.L. Karsten³, and H. Fujita¹
¹University of Tokyo, JAPAN, ²Kyoto University, JAPAN, and ³NeuroInDx Inc., USA
- T3P.21** **MINIATURISED SILICON BIOSENSOR FOR THE DETECTION OF TRIGLYCERIDE IN BLOOD SERUM**
M.S. Veeramani, P. Shyam, N.P. Ratchagar, A. Chadha, E. Bhattacharya, and S. Pavan
Indian Institute of Technology Madras, INDIA
- T3P.22** **PULLING OF HIGHLY FLEXIBLE OPTICAL FIBER BUNDLES USING UV-LIGHT CURING**
K. Kaiser¹, M. Chavarria¹, S. Rajaretnam¹, T. Zehlicke², and J. Müller¹
¹Hamburg University of Technology (TUHH), GERMANY and ²German Army Hospital of Hamburg, GERMANY
- T3P.23** **STRETCHABLE RECTANGULAR MICROWELLS FOR SINGLE CELL CAPTURE**
J.M. Labuz¹, M. Tokunaga¹, T.-H. Chun¹, and S. Takayama^{1,2}
¹University of Michigan, USA and ²Ulsan National Institute of Science & Technology (UNIST), SOUTH KOREA
- T3P.24** **TRAPPING HETEROGENEOUS CELLS IN L-SHAPED MICROWELL**
G.H. Lee and J.Y. Park
Chung-Ang University, SOUTH KOREA
- T3P.25** **NODE-PORE SENSING – A HIGHLY SENSITIVE TECHNIQUE FOR SCREENING BIOLOGICAL SPECIES**
K. Balakrishnan and L.L. Sohn
University of California, Berkeley, USA
- 13:55** **T3P - Poster Session 4**
- 15:25** **Keynote Speaker IV**
- T4K.4** **MECHANOMEDICINE: APPLICATIONS OF MECHANOBIOLOGY TO REGENERATIVE AND REPRODUCTIVE MEDICINE**
K. Naruse
Okayama University, JAPAN
- 18:00** **Banquet (Thursday Award Ceremony)**

Friday April 12, 2013

08:30 **Keynote Speaker V**

F1K.5 **MICROSCALE TISSUES: TISSUE ENGINEERING
MEETS DEVELOPMENTAL BIOLOGY**

C.M. Nelson
Princeton University, USA

09:20 **Keynote Speaker VI**

F1K.6 **OPTICAL TWEEZERS: BIOPHYSICS, ONE MOLECULE AT A TIME**

S.M. Block
Stanford University, USA

10:10 **Break**

10:40 **Flash Poster Session 5 - Tissue Engineering Applications**

F2P.01 **A 3D MICROFLUIDIC PLATFORM INCORPORATING METHACRYLATED
GELATIN HYDROGELS TO STUDY PHYSIOLOGICAL CARDIOVASCULAR
CELL-CELL INTERACTIONS**

M.B. Chen, S. Srigunapalan, A.R. Wheeler, and C.A. Simmons
University of Toronto, CANADA

F2P.02 **A STUDY OF USING AQUEOUS TWO-PHASE SYSTEM FOR
DROPLET-BASED ON-CHIP MICROEXTRACTION AND SEPARATION**

P.A.L. Wijethunga and H. Moon
University of Texas, Arlington USA

F2P.03 **AN IN-VITRO MODEL SYSTEM FOR GENERATION OF MECHANICALLY
CONDITIONED CARDIAC TISSUE CONSTRUCTS**

M.-D. Nguyen, J.P. Tinney, F. Yuan, T. Roussel, G. Giridharan, B.B. Keller, and P. Sethu
University of Louisville, USA

F2P.04 **CONTINUOUS MICROFLUIDIC PRODUCTION OF COMPLEX
HYDROGEL MATERIALS FOR FUNCTIONAL CELL CULTIVATION**

Y. Yajima, Y. Kitagawa, K. Yamakoshi, A. Kobayashi, Y. Naganuma, M. Yamada, and M. Seki
Chiba University, JAPAN

F2P.05 **DEVELOPMENT OF A MICROFLUIDIC CHIP AS ARTIFICIAL BLOOD
CAPILLARY VESSEL WITH INTEGRATED IMPEDANCE SENSORS
FOR APPLICATIONS IN CANCER RESEARCH**

T. Rajabi¹, R. Ahrens¹, J. Fauser¹, V. Huck², S.W. Schneider², and A.E. Guber¹
¹Karlsruhe Institut of Technology (KIT), GERMANY and ²Heidelberg University, GERMANY

F2P.06 **ENDOTHELIAL SIGNALING ON MICRO- & NANO-PATTERNED TITANIUM**

P. Vandurangi, R. Kozaka, S.C. Gott, M.P. Rao, and V.G.J. Rodgers
University of California, Riverside, USA

F2P.07 **ENGINEERING OF FUNCTIONAL, PERFUSABLE 3D
MICROVASCULAR NETWORKS ON A CHIP**

S. Kim, H. Lee, M. Chung, and N.L. Jeon
Seoul National University, SOUTH KOREA

- F2P.08** **INDIVIDUAL TRAPPING OF LUNG CANCER CELL SPHEROIDS ON A MICROFLUIDIC PLATFORM FOR CHEMOSENSITIVITY ASSAYS**
J. Ruppen¹, L. Cortes-Dericks^{1,2}, E. Marconi¹, R. Schmid^{1,2}, G. Karoubi^{1,2}, and O. Guenat¹
¹University of Bern, SWITZERLAND and ²University Hospital of Bern, SWITZERLAND
- F2P.09** **MATRIX MICROARRAYS TO SCREEN STEM CELL-MATRIX INTERACTIONS REVEAL CDC42 AS A CONVERGENT REGULATOR OF OSTEOGENESIS BY MATRIX MECHANICAL AND BIOCHEMICAL SIGNALING**
W.L.K. Chen¹, D.A. Romero¹, P.W. Oakes², K.L. Sider¹, C.H. Amon¹, and C.A. Simmons¹
¹University of Toronto, CANADA and ²University of Chicago, USA
- F2P.10** **MIMICKING THE MICRO-SCALE TISSUE ARCHITECTURE USING STEREO LITHOGRAPHY AND DIELECTROPHORESIS**
P. Bajaj, D. Marchwiany, C. Duarte, and R. Bashir
University of Illinois, Urbana-Champaign, USA
- F2P.11** **PHARMACOKINETICS AND PHARMACODYNAMICS ON A CELL CHIP**
M. Hamon¹, A. Khademhosseini², and J.W. Hong¹
¹Auburn University, USA and ²Brigham and Women's Hospital, Harvard Medical School, USA
- F2P.12** **PHYSIOLOGICALLY RELEVANT IN VITRO MODEL OF VASCULARIZED MAMMARY TISSUE TO STUDY BREAST CANCER PROGRESSION**
L.L. Bischel¹, K.E. Sung¹, E.W.K. Young², B.R. Mader¹, and D.J. Beebe¹
¹University of Wisconsin, Madison, USA and ²University of Toronto, CANADA
- F2P.13** **STAMPED PETRI DISHES FOR 3D CELL CULTURE AND DRUG TESTING**
A. Sridhar, H.L. de Boer, A. van den Berg, and S. Le Gac
University of Twente, THE NETHERLANDS
- F2P.14** **TOWARDS IN-VIVO-LIKE ALVEOLAR EPITHELIAL MICROINJURIES**
M. Felder¹, A. Stucki¹, T. Geiser^{1,2}, and O.T. Guenat¹
¹University of Bern, SWITZERLAND and ²University of Bern, SWITZERLAND
- F2P.15** **TUNABLE MICROPOST ARRAYS FOR STUDYING BREAST CANCER MICROENVIRONMENTS**
A. Kesavaraju, E. Jabart, B. Qing, and L.L. Sohn
University of California, Berkeley, USA
- F2P.16** **UNIFORM-SIZED EMBRYOID BODY FORMATION AND DIFFERENTIATION IN A MICROFLUIDIC DEVICE**
Y.-H. Chen, C.-C. Peng, and Y.-C. Tung
Academia Sinica, TAIWAN
- F2P.17** **A LONG-TERM IMPLANTABLE MICRO ELECTRODE ARRAY (MEA) TO INVESTIGATE HEART REGENERATION IN ZEBRAFISH**
H. Cao¹, F. Yu¹, Y. Zhao², Y.C. Tai², and T.K. Hsiai¹
¹University of Southern California, USA and ²California Institute of Technology, USA

- F2P.18** **A MICROFLUIDIC-BASED PLATFORM FOR *IN VITRO* STUDIES OF EXTRAVASATION OF CIRCULATING TUMOR CELLS**
R. Riahi, Y. Yang, H. Kim, L. Jiang, P.K. Wong, and Y. Zohar
University of Arizona, USA
- F2P.19** **DESIGN CRITERIA-GUIDED FORMULATION OF PLURIPOTENT STEM CELL-DERIVED CARDIAC MICROTISSUES**
N. Thavandiran¹, N. Dubois¹, A. Mikryukov¹, S. Massé², B. Beca¹, C.A. Simmons¹, V. Deshpande³, P. McGarry⁴, C.S. Chen⁵, K. Nanthakumar², G. Keller¹, M. Radisic¹ and P.W. Zandstra¹
¹*University of Toronto, CANADA*, ²*University Health Network, CANADA*, ³*University of Cambridge, UK*, ⁴*National University of Ireland, IRELAND*, and ⁵*University of Pennsylvania, USA*
- F2P.20** **INTEGRATED 384 HANGING DROP SPHEROID PLATE AND COMPLEMENTARY CAPTURE AND ANALYSIS PLATE**
S.P. Cavnar, E. Salomonsson, K.E. Luker, G.D. Luker, and S. Takayama
University of Michigan, USA
- F2P.21** **MAMMARY SPHEROID IN MICROENCAPSULATED SANDWICH CULTURE**
B.M. Leung¹, C. Moraes¹, J.M. Labuz¹, and S. Takayama^{1,2}
¹*University of Michigan, USA*
²*Ulsan National Institute of Science & Technology (UNIST), SOUTH KOREA*
- F2P.22** **MEASUREMENT OF ATP CONCENTRATION OF INDIVIDUAL CELLS WITH ELECTROACTIVE MICROWELL ARRAY**
S.H. Kim^{1,2}, D. Fourmy³, and T. Fujii^{1,2}
¹*University of Tokyo, JAPAN*, ²*Japan Science and Technology Agency (JST), JAPAN*, and ³*CNRS, FRANCE*
- F2P.23** **MICROFLUIDIC CHIP WITH PERFUSION CHAMBERS CONTROLLED BY PNEUMATIC VALVE FOR SUSPENSIVE MICROALGAE**
Y.-J. Eu¹, H.-S. Park¹, and D. Kim²
¹*Chungnam National University, SOUTH KOREA* and ²*Pohang University of Science and Technology, SOUTH KOREA*
- F2P.24** **RESONANT RESPONSE VALIDATION OF MICRO-CHANNEL ENCAPSULATED DISK RESONATORS VIA FLUORESCENT IMAGING**
A. Iqbal¹, J. Chapin¹, E. Mehdizadeh², B. Purse¹, and S. Pourkamali¹
¹*University of Denver, USA* and ²*University of Texas, Dallas, USA*
- F2P.25** **RESPONSE CHARACTERIZATION OF PIEZOELECTRIC ROTATIONAL MODE DISK RESONANT BIOMOLECULAR SENSORS**
E. Mehdizadeh¹, J. Chapin², J. Gonzales³, R. Abdolvand³, B. Purse², and S. Pourkamali¹
¹*University of Texas, Dallas, USA*, ²*University of Denver, USA*, and ³*Oklahoma State University, USA*
- F2P.26** **SENSITIVE BIOASSAY FOR DETECTION AND QUANTIFICATION OF BIOLOGICALLY ACTIVE TOXINS**
R. Rasooly
United States Department of Agriculture, USA

11:10 **F2P – Poster Session 5**

12:30 Friday Award Ceremony

12:45 Conference Adjourns