

Sunday, October 5, 2003

2:00-6:00 pm

Registration

4:30-6:00 pm

Wine and Cheese Welcome Reception

Monday, October 6, 2003

8:15-8:30 am

Opening Remarks

8:30-9:10 am
Plenary I

BIOLOGICAL LARGE SCALE INTEGRATION

Stephen R. Quake
California Institute of Technology

9:15-10:15 am
Nanofluidics I

INJECTION AND ULTRAFAST MIXING OF ATTOMOLE SAMPLES VIA MICRO-NANOFUIDIC GATES FOR ON-CHIP BIOCHEMICAL ANALYSIS
M.A. Shannon, T.-C. Kuo, H.-K. Kim, D.M. Cannon Jr., B.R. Flachsbart, J.V. Sweedler and P.W. Bohn
University of Illinois at Urbana-Champaign

FABRICATION AND EVALUATION OF 2D CONFINED NANOCANNELS

J.P. Alarie¹, A.B. Hmelo², S.C. Jacobson¹, A.P. Baddorf¹, L. Feldmen² and J.M. Ramsey¹
¹Oak Ridge National Laboratory and ²Vanderbilt University

WATER PLUGS IN NANOCANNELS UNDER NEGATIVE PRESSURE

N.R. Tas¹, P. Mela¹, T. Kramer², J.W. Berenschot¹ and A. van den Berg¹
¹University of Twente and ²EPFL

9:15-10:15 am
Cells I

HUMAN EMBRYONIC STEM CELL CULTURE IN MICROFLUIDIC CHANNELS
V.V. Abhyankar, G.N. Bittner, J.A. Causey, T.J. Kamp and D.J. Beebe
University of Wisconsin

FIXATION OF MICROORGANISMS FOR INVESTIGATION OF THEIR PROPERTIES ON A CHIP

F. Arai¹, H. Maruyama¹, T. Fukuda¹ and T. Katsuragi²
¹Nagoya University and ²Nara Institute of Science and Technology

NANO HOLE ARRAYS FOR PARALLEL PATCH-CLAMPING AND FOCAL DELIVERY OF BIOCHEMICAL FACTORS TO CELLS

T.F. Kosar, N.L. Stucky, C. Chen, K.J. Kim and A. Folch
University of Washington

10:15-10:45 am

Break

10:45-11:45 am
Nanofluidics II

FABRICATION OF NANOCANNELS WITH PDMS, SILICON AND GLASS WALLS AND SPONTANEOUS FILLING BY CAPILLARY FORCES
T.S. Hug, D. Parrat, P.-A. Künzi, U. Staufer, E. Verpoorte and N.F. de Rooij
University of Neuchâtel

10:45-11:45 am

BIOMOLECULAR MOTORS AS NOVEL PRIME MOVERS FOR MicroTAS: MICROFABRICATION AND MATERIALS ISSUES

T.S. Kim, H.K. Nanjundaswamy, C.-T. Lin, S. Lakämper, L.J. Cheng, D. Hoff, E.F. Hasselbrink, L.J. Guo, K. Kurabayashi, A.J. Hunt and E. Meyhöfer
University of Michigan

NATURE'S PACKAGING: USING BIO-INSPIRED LIPOSOMES FOR RAPID, HIGH EFFICIENCY MIXING IN MICROFLUIDIC SYSTEMS

W.N. Vreeland and L.E. Locascio
National Institute of Standards and Technology

10:45-11:45 am
Cells II

CONTINUOUS STREAMING DIELECTROPHORETIC FILTER/CONCENTRATORS

E.B. Cummings, G.J. Fiechtner, A.K. Singh, B.A. Simmons, Y. Fintschenko and B.H. Lapizco-Encinas
Sandia National Laboratories

MICRO FLOW CYTOMETERS USING ELECTROKINETIC FORCES WITH INTEGRATED OPTICAL FIBERS FOR ON-LINE CELL/PARTICLE COUNTING AND SORTING

G.-B. Lee¹, L.-M. Fu², R.-J. Yang¹ and Y.-J. Pan¹
¹*National Cheng Kung University* and
²*National Pingtung University of Science and Technology*

AUTO-ACTUATED MICROFLUIDICS FOR TIME-VARYING STIMULATION OF LIVING CELLS

K.R. King^{1,2} and M. Toner^{1,2}
¹*Harvard-MIT Division of Health Science and*
²*Technology and Massachusetts General Hospital*

11:45 am - 1:30 pm

Grab 'N Go Lunch

1:30 - 2:10 pm
Plenary II

NANOPORES AND PROSPECTS FOR SINGLE MOLECULE ELECTROPHORESIS

Daniel Branton and H. Wang
Harvard University

2:15 - 5:00 pm
Microfluidics

Poster Session

PLANAR CAPILLARY PUMPED INK DELIVERY APPARATUS FOR DIP PEN NANOLITHOGRAPHY (DPN)

D. Banerjee, J. Fragala, T. Duenas, R. Shile and B. Rosner
NanoInk Inc.

MOVING DROPLETS WITH MICROCATENARIES

Y. Fouillet, H. Jeanson, D. Jary, O. Constantin and C. Vauchier
CEA

INSULATING POST ELECTRODELESS DIELECTROPHORESIS FOR THE CONCENTRATION OF BACTERIA

Y. Fintschenko, B.A. Simmons, B.H. Lapizco-Encinas and E.B. Cummings
Sandia National Laboratories

MICROBUBBLE BEAM (MBB), A POTENTIAL DISPERSION MECHANISM FOR MULTIPHASE GAS-LIQUID MICROREACTOR SYSTEMS

G.N. Doku, W.W. Verboom, D.N. Reinhoudt and A. van den Berg
University of Twente

A NOVEL CHAOTIC MICROMIXER: BARRIER EMBEDDED KENICS MICROMIXER
D.S. Kim, I.H. Lee, T.H. Kwon and D.-W. Cho
Pohang University of Science and Technology

MICROFLUIDIC CHIP-BASED LIQUID-LIQUID EXTRACTION AND PRECONCENTRATION USING A NOVEL DROPLET TRAPPING TECHNIQUE
Q. Fang, H. Chen, Z.-X. Cai, X.-F. Yin, H.-W. Chen and Z.-L. Fang
Zhejiang University

TOWARDS A MINIATURIZED AMBIENT AMMONIA DETECTION SYSTEM
B.H. Timmer¹, K.M. van Delft¹, R.P. Otjes², W. Olthuis¹,
P. Bergveld¹ and A. van den Berg¹
¹University of Twente and ²Energy Research Centre of the Netherlands

INTRINSIC AUTOFLUORESCENCE OF SINGLE LIVING CELLS FOR LABEL-FREE CELL SORTING IN A MICROFLUIDIC SYSTEM
J. Emmelkamp¹, R. DaCosta², H. Andersson^{1,3} and A. van den Berg¹
¹University of Twente, ²University of Toronto and ³Royal Institute of Technology

DESTACKING LOADING CONDITIONS ON A CE CHIP FOR MEASURING SAMPLES WITH A HIGH MATRIX CONCENTRATION
E.X. Vrouwe and A. van den Berg
University of Twente

DISPENSING SYSTEM FOR LOCALIZED STIMULATION OF NEURAL CELL NETWORKS
S. Koster¹, A. Blau², C. Ziegler², J.-C. Roulet¹, N.F. de Rooij¹ and E. Verpoorte¹
¹University of Neuchâtel and ²University of Kaiserslautern

SIMULATING CHAOTIC MICRO MIXER USING LATTICE BOLTZMANN METHOD
C. Li and T.N. Chen
Xi'an Jiaotong University

GENERATING ALTERNATIVE PULSED FLOW FOR ACCELERATED MIXING ON A PLUG AND PLAY MICROFLUIDIC DEVICE
Y. Sando¹, K. Higashino¹, Y. Fujii¹, T. Fukuba², S. Usui² and T. Fujii²
¹Minolta Co. Ltd. and ²University of Tokyo

DEVELOPMENT OF ELECTROSMOTIC MULTI-VORTICAL FLOW USING MICROELECTRODE SYSTEM
S.J. Kim, H.S. Cha, I.S. Kang and B.J. Yoon
Pohang University of Science and Technology

DESIGN OF A RECYCLE-MICROMIXER
M.K. Jeon¹, J.-H. Kim², J. Noh¹, S.I. Woo¹, E. Yoon¹ and H.G. Park¹
¹Korea Advanced Institute of Science and Technology and
²Samsung Advanced Institute of Technology

DYNAMICS OF SHEAR-INDUCED DROP FORMATION IN T-SHAPED MICROCHANNELS
J. Husny¹, H. Jin², E. Harvey² and J. Cooper-White¹
¹University of Melbourne and ²Swinburne Institute of Technology

THEORETICAL AND EXPERIMENTAL ANALYSIS OF THERMAL TRANSPORT IN POLYMER MICROCHANNELS
C. Kimball and D.L. DeVoe
University of Maryland

EXPERIMENTAL AND NUMERICAL CHARACTERIZATIONS OF BARRIER EMBEDDED MICROMIXER
D.S. Kim, T.G. Kang, S.W. Lee and T.H. Kwon
Pohang University of Science and Technology

PULSED FLOW MIXING FOR BIOMEMS APPLICATIONS

I. Glasgow and N. Aubry
New Jersey Institute of Technology

FLUIDIC ENCAPSULATION IN SU-8 μ -RESERVOIRS

A.J. Nijdam¹, A.H. Monica¹, A.P. Gadre¹, J.A. Garra¹, T.J. Long^{1,2}, C. Luo¹,
M.-C. Cheng¹, T.W. Scheider^{1,2}, R.C. White^{1,2}, M. Paranjape¹ and J.F. Currie¹
¹Georgetown University and ²SAIC

*ANALYTICAL DISPERSION MODELS FOR EFFICIENT SIMULATION
OF COMPLEX MICROCHIP ELECTROPHORESIS SYSTEMS*

Y. Wang, Q. Lin and T. Mukherjee
Carnegie Mellon University

*CONDUCTIVITY PULSE TIME-OF-FLIGHT FLOW SENSOR FOR
SUB-MICROLITER/MINUTE FLOWRATES*

C.K. Harnett, B.P. Mosier, P.F. Caton, B. Wiedenman and R.W. Crocker
Sandia National Laboratories

*DETECTION AND IDENTIFICATION OF VIRAL AGENTS BY PROTEIN
FINGERPRINTING USING THE HAND PORTABLE μ CHEMLAB*

J.A.A. West, T.W. Lane, J.F. Stamps, I.R. Shokair and J.A. Fruetel
Sandia National Laboratories

NARROWING MICROFLUID WIDTH IN MICROCHANNEL USING AIR BOUNDARIES

S.U. Son and S.S. Lee
Pohang University of Science and Technology

*TWO-PHASE FLOW TESTS IN A Y-SHAPED MICROCHANNEL
AND VERIFICATION BY SIMULATION*

R. Anraku¹, A. Hattori¹, T. Asai¹, T. Fukuzawa¹, M. Tokeshi² and T. Kitamori³
¹Nippon Sheet Glass, ²Kanagawa Academy of Science and Technology and
³University of Tokyo

A VERSATILE MACRO-TO-MICRO DISPENSING SYSTEM

G. Jesson, G. Kylberg and P. Andersson
Gyros AB

FLEXIBLE MAGNETIC FILAMENTS AS MICROMECHANICAL SENSORS

P. Jop, C. Goubault, C. Derec, J. Baudry, E. Bertrand, J. Bibette and M. Fermigier
ESPCI

AMPLICON-SHUTTLED NUCLEIC ACID AMPLIFICATION

K.-H. Lee, J. Chung and J. Lee
Northwestern University

A PASSIVE 2-DIMENSIONAL LIQUID SAMPLE MICROMIXER

J. Melin, G. Giménez, N. Roxhed, W. van der Wijngaart and G. Stemme
Royal Institute of Technology

TEMPERATURE CONTROLLED MICROFLUIDIC PDMS REACTOR

M. Chudy, P. Prokaryn, A. Dybko and Z. Brzozka
Warsaw University of Technology

*CAPILLARY-DRIVEN PASSIVE RETARDING MICROVALVE
BASED ON AN ASPECT RATIO CONCEPT*

S.-J. Kim, Y.B. Shin, D.-S. Lee, H. Yang, K. Kim, S.H. Park and Y.T. Kim
Electronics and Telecommunications Research Institute

MEMS Technology

FABRICATION OF MICRO CELL COUNTER INTEGRATED WITH OXYGEN MICROPUMP
S.U. Son, Y.H. Choi and S.S. Lee
Pohang University of Science and Technology

MICROFLOW CONTROL USING THERMALLY RESPONSIVE TRIBLOCK COPOLYMERS
B. Stoeber, D. Liepmann and S.J. Muller
University of California, Berkeley

SUBMICROLITER-VOLUME PCR CHIP WITH FAST THERMAL RESPONSE
AND VERY LOW POWER CONSUMPTION
D.-S. Lee, S.H. Park, H. Yang, T.H. Yoon, S.-J. Kim, H. Kim, Y.B. Shin,
K. Kim and Y.T. Kim
Electronics and Telecommunications Research Institute

A DRY RELEASE TECHNIQUE FOR POLYMER μ -TAS INTEGRATION
M.C. Cheng¹, A.J. Nijdam¹, J.A. Garra¹, A.P. Gadre¹,
T.W. Schneider², R.C. White², M. Paranjape¹ and J.F. Currie¹
¹Georgetown University and ²Science Applications International Corporation

ELECTROACTIVE POLYMERS FOR MICROACTUATORS AND MICROFLUIDIC DEVICES
F. Xia¹, T.-B. Xu², S. Tadigadapa¹ and Q.M. Zhang¹
¹Penn State University and ²NASA/LaRC

MULTI-POLYMER FABRICATION OF A BIO-FLUIDIC TRANSDERMAL SAMPLING DEVICE
A.P. Gadre¹, Y.N. Srivastava¹, J.A. Garra¹, A.J. Nijdam¹, A.H. Monica¹,
M.C. Cheng¹, C. Luo¹, T.W. Schneider^{1,2}, T.J. Long², R.C. White^{1,2},
T. Hylton¹, M. Paranjape¹ and J.F. Currie¹
¹Georgetown University and ²Science Application International Corporation

THREE-DIMENSIONAL MICRO CAPILLARIES FORMED BY GRAY-SCALE LITHOGRAPHY
OF PHOTSENSITIVE GLASS
R. Mori and Y. Matsumoto
Keio University

POLYMERIC MECHANICAL SENSORS WITH STRAIN GAUGE READOUT
IN A MICROFLUIDIC SYSTEM
M. Calleja, P. Rasmussen, A. Johansson and A. Boisen
Technical University of Denmark

PAINLESS Si NEEDLE ARRAY CHIP COLLECTING BLOOD FROM CAPILLARY VESSEL
AND COMBINED CENTRIFUGAL SEPARATION CHIP
S. Momose¹, T. Fukasawa², H. Takasu¹ and Y. Horiike³
¹Rohm Co., Ltd., ²University of Tokyo and ³National Institute of Materials Science

10-WAY MICRO SWITCHING VALVE CHIP FOR MULTI-DIRECTIONAL FLOW CONTROL
T. Hasegawa¹, K. Ikuta² and K. Nakashima¹
¹Osaka Institute of Technology and ²Nagoya University

NOVEL MICROPUMP ACTUATED BY DRYING OF GEL
Y.H. Choi and S.S. Lee
Pohang University of Science and Technology

ELECTROSMOTIC PUMP WITH ION EXCHANGE MEMBRANES AND
A CURRENT FEEDBACK FOR FLOW CONTROL
A. Brask, H. Bruus and J.P. Kutter
Technical University of Denmark

Applications

USING TURBULENT FLOW TO ENHANCE HYBRIDIZATION-REACTION KINETICS OF DNA PROBES ON BEADS ARRAYED IN A CAPILLARY

Y. Kohara, H. Noda, K. Okano and H. Kambara
Hitachi, Ltd.

INTEGRATING SINGLE CELL INJECTION, CELL LYSIS AND SEPARATION OF INTRACELLULAR CONSTITUENTS ON A MICROFLUIDIC CHIP

J. Gao, X.-F. Yin and Z.-L. Fang
Zhejiang University

A NEW APPROACH TO PLASTIC MICROFLUIDIC HYBRIDIZATION ARRAY DEVICES FABRICATION AND IMPROVED HYBRIDIZATION KINETICS WITH SAMPLE OSCILLATION

Y. Liu, C.B. Rauch and F. Zenhausern
Arizona State University

CAPTURE OF RARE CELLS BY MAGNETIC FILAMENTS

C. Goubalt^{1,2}, J.-L. Viovy² and J. Bibette¹
¹ESPCI and ²Institut Curie

LIGHT-DIRECTED ASSEMBLY OF MICROARRAY IN A GLASS CAPILLARY

B. Fouqué, S. Porte, M. Balakirev, M. Berger, F. Perraut and F. Chatelain
CEA-Grenoble

ELECTROPHORETIC BEHAVIOR OF SUGAR ISOMERS INVESTIGATED BY MICROCHIP ELECTROPHORESIS AND VIDEOMICROSCOPY

F.Q. Dang¹, L.H. Zhang², M. Ishigawa¹ and Y. Baba^{1,2}
¹AIST and ²University of Tokushima

POLYMER SYNTHESIZER BASED ON MAGNETIC TRANSPORT OF PARTICLES

M. Ikeuchi¹ and M. Washizu²
¹Nagoya University and ²University of Tokyo

MULTIPLEX PCR ON MULTICHANNEL MICROCHIP ELECTROPHORESIS, AN ULTRAFAST TECHNOLOGY FOR GENETIC DIAGNOSIS

M. Jabasini¹, F. Xu¹, Y. Nakahori¹ and Y. Baba^{1,2}
¹University of Tokushima and ²Shimadzu Corp.

FAST SCREENING REDUCED-VISCOSITY MIXED POLYMER SOLUTIONS USING AN ORTHOGONAL DESIGNING APPROACH FOR MICROCHIP SEPARATION OF SPECIFIC DNA

F. Xu^{1,2}, M. Jabasini¹ and Y. Baba^{1,3}
¹University of Tokushima, ²Shimadzu Corp. and ³National Institute of Advanced Industrial Science and Technology

DETECTION OF SINGLE-BASE MUTATION BY AFFINITY CAPILLARY ELECTROPHORESIS IN A PDMS-GLASS HYBRID MICRODEVICE

T. Ito, A. Inoue, K. Sato, K. Hosokawa and M. Maeda
RIKEN

PRECISE CONTROL OF THE REIMER-TIEMANN REACTION USING INTEGRATED HEATING AND THERMOCHROMIC LIQUID CRYSTALS

R. Fortt¹, A. Iles² and A.J. de Mello²
¹Central Research Laboratories Ltd. and ²Imperial College London

FETAL HUMAN HEPATOCYTES AND ENDOTHELIAL CELLS CO-CULTURE IN MICROFLUIDIC ENVIRONMENT

E. Leclerc, Y. Sakai and T. Fujii
University of Tokyo

MICROFLUIDIC IMMUNOASSAY CHIP WITH INTEGRATED LIQUID HANDLING
M. Schlüter¹, S. Mammitzsch², M. Martens², S. Gasso² and H.-J. Lilienhof¹
¹University of Applied Sciences and ²Future Diagnostics b.v.

ANALYSIS OF SITE-SPECIFIC ENHANCEMENT OF GENE TRANSFECTION UTILIZING ATTRACTING ELECTRIC FIELD FOR DNA PLASMIDS ON THE ELECTROPORATION MICROCHIP
C.-P. Jen, W.-M. Wu, M. Li and Y.-C. Lin
National Cheng Kung University

IN SITU CELL MONITORING ON A MICROCHIP USING TIME-RESOLVED FLUORESCENCE ANISOTROPY ANALYSIS
T. Munaka^{1, 2}, M. Kanai^{1, 3}, H. Abe¹, Y. Fujiyama¹, T. Sakamoto², A. Mahara², A. Yamayoshi², H. Nakanishi¹, S. Shoji³ and A. Murakami²
¹Shimadzu Corporation, ²Kyoto Institute of Technology and ³Waseda University

SNP ANALYSIS BY DYNAMIC ALLELE SPECIFIC HYBRIDIZATION ON PATTERNED MONOLAYERS OF BEADS
A. Russom¹, G. Axehult¹, T. Mayr², P. Melväs¹, A.J. Brookes², H. Andersson¹ and G. Stemme¹
¹Royal Institute of Technology and ²Karolinska Institute

DEVELOPMENT OF IN SITU FLOW-THROUGH ANALYZER OF Mn²⁺ IN SEAWATER WITH A PDMS MICROFLUIDIC DEVICE
S. Usui and T. Fujii
University of Tokyo

POLYMER-BASED MICROFLUIDIC DEVICE FOR IMMUNOSENSING LOC (LAB-ON-A-CHIP)
J.S. Ko, H.C. Yoon, K.H. Chung, H. Yang, H.B. Pyo, S.-J. Kim and Y.T. Kim
Electronics and Telecommunications Research Institute

CONTINUOUS CELL SEPARATION BY CHIP-BASED TRAVELING-WAVE DIELECTROPHORESIS AND LAMINAR FLOW
L. Wang^{1, 2}, M. Guo¹, C.-J. Huang^{1, 3} and J. Cheng^{1, 2}
¹National Engineering Research Center for Beijing Biochip Technology, ²Tsinghua University and ³Huazhong University of Science and Technology

MICRO-FLOW-SYSTEMS WITH BIOSENSOR DETECTION FOR IN-VIVO USE
I. Moser¹, G. Jobst¹, P.S. Petrou² and G.A. Urban¹
¹IMTEK and ²Immunoassay Laboratories

DYNAMIC LABELING OF NON-DENATURED AND HEAT-DENATURED PROTEINS FOR LASER-INDUCED FLUORESCENCE (LIF) DETECTION ON MICROCHIPS
B.C. Giordano¹, D. Burgi², S. Kouresh¹, J.P. Ferrance¹ and J.P. Landers¹
¹University of Virginia and ²dbqp

MICRO-ACTUATED ALUMINUM GALVANIC AND SEMI-FUEL CELLS FOR POWERING REMOTE LAB-ON-A-CHIP APPLICATIONS
A. Cardenas-Valencia, D. Fries, H. Broadbent, L. Langebrake and R. Benson
University of South Florida

Micromachining

SU-8 TECHNOLOGY AND MONOLITHIC COLUMNS FOR INTEGRATION
IN A BIOLOGICAL LAB-ON-CHIP

J. Carlier¹, S. Le Gac², S. Arscott¹, V. Thomy¹, J.C. Fourrier¹, F. Caron¹,
C. Cren-Olivé², C. Rolando², J.C. Camart¹, C. Druon¹ and P. Tabourier¹
¹Institut d'Electronique de Microélectronique et de Nanotechnologie and
²Université des Sciences et Technologie de Lille

A 1480-nm/1064-nm DUAL WAVELENGTH PHOTO-THERMAL
ETCHING SYSTEM FOR NON-CONTACT THREE-DIMENSIONAL MICROSTRUCTURE
GENERATION INTO AGAR MICROCULTURE CHIP

A. Hattori^{1, 2}, H. Moriguchi¹, S. Ishiwata³ and K. Yasuda¹
¹University of Tokyo, ²Sigma Koki, Co. Ltd. and ³Waseda University

DIRECT-WRITING AND DEBRIS-FREE LASER MICROMACHINING ON GLASS BY
PHOTO ASSISTED CHEMICAL ETCHING

M.-H. Yen and J.-Y. Cheng
Academia Sinica

PHYSICAL IMMOBILIZATION AND POLYMERIC MICROCHANNEL NETWORKS
TO ACHIEVE DEFINED NEURONAL NETWORK STRUCTURES

F. Greve, J. Lichtenberg, H. Hall, A. Hierlemann and H. Baltes
ETH Zurich

MICRODEVICE FOR FLOW-THROUGH ELECTROPORATION USING
MULTI-HOLED ELECTRODES

M. Fukui¹, M. Yamada¹, N.Y. Lee¹ and M. Seki^{1, 2}
¹University of Tokyo and ²Osaka Prefecture University

A NOVEL MAGNETIC CHAOTIC MIXER FOR IN-FLOW MIXING OF MAGNETIC BEADS

R. Rong, J.W. Choi and C.H. Ahn
University of Cincinnati

SINGLE SUBSTRATE INTEGRATION OF OPTICAL WAVEGUIDES,
MICROFLUIDIC CIRCUITRY AND PHOTODIODES

A.M. Jorgensen and O. Geschke
Technical University of Denmark

A METHOD TO MONOLITHICALLY INTEGRATE ELASTOMER O-RINGS ON
PARYLENE MEMBRANES FOR IMPROVED VALVE SEALING

K.S. Ryu, K. Shaikh and C. Liu
University of Illinois, Urbana-Champaign

RAPID PROTOTYPING 3D MICROSTRUCTURES ON SOFT AND RIGID TEMPLATES
USING A SCANNING LASER SYSTEM

H. Yu, A. Grüntzig, Y. Zhao, A. Sharon, B. Li and X. Zhang
Boston University

BATCH INTEGRATION OF STIMULI-SENSITIVE HYDROGELS IN MEMS
MICROSTRUCTURES WITH ENVIRONMENTAL EXPOSURE

M. Lei, A. Baldi, T. Pan, Y. Gu, R.A. Siegel and B. Ziaie
University of Minnesota

Detection Technologies

ELECTROCHEMICAL DETECTION AND PHOTONIC REPORTING IN
DUAL-CHANNEL MICROFLUIDIC-BASED CHEMICAL SENSORS

J. Alvarez, W. Zhan, L. Sun and R.M. Crooks
Texas A&M University

*PRACTICAL STUDIES ON COMPACT PHOTO-THERMAL LENS SPECTROSCOPY
DETECTION SYSTEM WITH MICRO CHEMICAL CHIP*

A. Hattori¹, H. Yamaguchi¹, J. Yamaguchi¹, Y. Matsuoka¹, S. Kanki¹, T. Fukuzawa¹,
T. Miwa¹, M. Toyama¹, M. Tokeshi² and T. Kitamori³

¹Nippon Sheet Glass Co., Ltd., ²Kanagawa Academy of Science and Technology and
³University of Tokyo

*LASER BACKGROUND REJECTION OPTIMIZATION IN INTEGRATED OPTOELECTRONIC
FLUORESCENCE SENSORS*

E. Thrush¹, O. Levi¹, W. Ha², G. Carey¹, L.J. Cook¹, J. Diech¹, S.J. Smith¹,
W.E. Moerner¹ and J.S. Harris Jr.¹

¹Stanford University and ²Novalux Inc.

*APPLICATION OF THE THERMAL LENS MICROSCOPE AS A DETECTOR OF
THE BIOPOLYMER IN MICROCHIP ELECTROPHORESIS*

H. Nagata^{1,2}, K. Hirano^{1,2}, M. Tabuchi^{1,2} and Y. Baba^{1,2,3}

¹University of Tokushima, ²Japan Science and Technology Corporation and
³National Institute of Advanced Industrial Science and Technology

INTEGRATED ELECTROCHEMICAL DNA SENSORS WITH MICROFLUIDIC CHANNEL REACTOR

C. Oda¹, K. Sawada¹, T. Tsuchiya², H. Takao¹ and M. Ishida¹

¹Toyohashi University of Technology and ²Fuji Photo Film Co., Ltd.

*FABRICATION OF OPEN PDMS ELECTROSPRAY TIPS INTEGRATED WITH
MICROCHANNELS USING REPLICATION FROM A NICKEL MASTER*

M. Svedberg¹, M. Veszelej², J. Axelsson², M. Vangbo² and F. Nikolajeff¹

¹Uppsala University and ²Amersham Biosciences

STANDING-WAVE MICROSPECTROMETER FOR MULTIPLE FLUORESCENCE DETECTION

S.R. Bhalotra, H.L. Kung, J. Fu, N.C. Helman, O. Levi,
D.A.B. Miller and J.S. Harris, Jr.

Stanford University

*INTEGRATION OF OLED LIGHT SOURCE AND OPTICAL FIBERS ON A PDMS BASED
MICROFLUIDIC DEVICE FOR ON-CHIP FLUORESCENCE DETECTION*

S. Camou^{1,2}, M. Kitamura², Y. Arakawa² and T. Fujii²

¹CNRS-IIS and ²University of Tokyo

*ENHANCEMENT OF SIGNAL-TO-NOISE LEVELS BY SYNCHRONIZED DUAL WAVELENGTH
MODULATION FOR LIGHT EMITTING DIODE (LED) FLUORIMETRY IN
MICROFLUIDIC SYSTEMS*

T. Zhang¹, Q. Fang², S.-L. Wang¹ and Z.-L. Fang²

¹Northeastern University and ²Zhejiang University

*DEVELOPMENT OF A REFLECTED LIGHT FLUORESCENCE UNIT FOR
THE MICROFLUIDIC DETECTION SYSTEM*

S.-I. Fujii, T. Tokuyama, M. Abo and A. Okubo

University of Tokyo

*ON-LINE ELECTROCHEMICAL DEVICE FOR HIGHLY SENSITIVE MONITORING
OF BIOMOLECULES IN BLOOD*

K. Hayashi¹, Y. Iwasaki¹, R. Kurita², T. Horiuchi¹, K. Sunagawa³ and O. Niwa¹

¹NTT Microsystem Integration Laboratories, ²NTT Advanced Technology
Corporation and ³National Cardiovascular Center

*BIOSENSOR BASED ON SU-8 CANTILEVER BY USING ELECTROSPRAY
DEPOSITION OF PROTEINS*

J. W. Kim^{1,2}, Y. Yamagata¹, B.J. Kim², S. Takeuchi² and T. Higuchi²

¹Riken and ²University of Tokyo

5:00 - 6:00 pm
Separations I

*DISPOSABLE HEALTHCARE CHIP ALLOWING MULTI-ITEM DIAGNOSTICS
IN A TRACE OF BLOOD*

M. Takai¹, S. Shinbashi², H. Ogawa², A. Oki³, M. Nagai² and Y. Horiike³
¹University of Tokyo, ²Japan Science and Technology Corporation and
³National Institute of Materials Science

*FABRICATION OF MICROCHIPS FOR RUNNING LIQUID CHROMATOGRAPHY
BY MAGNETOHYDRODYNAMIC FLOW*

J.-B. Bao and D.J. Harrison
University of Alberta

FUNCTIONALLY INTEGRATED MEMS MICRO GAS CHROMATOGRAPH SUBSYSTEM

C.-J. Lu, W.-C. Tian, W.H. Steinecker, A. Guyon, M. Agah,
M.C. Oborny, R.D. Sacks, K.D. Wise, S.W. Pang and E.T. Zellers
University of Michigan

*SELF-ASSEMBLY OF COLLOIDS FOR PLASTIC CAPILLARY
ELECTROCHROMATOGRAPHY CHIP*

S. Horiike¹, S.H. Lee², T. Nishimoto¹ and C.H. Ahn²
¹Shimadzu Corporation and ²University of Cincinnati

5:00 - 6:00 pm
Materials

*MICROCHIP-BASED DIALYSIS OF PROTEIN SAMPLES USING PHOTOPATTERNED
NANOPOROUS MEMBRANES*

S. Song, T.J. Shepodd, A.K. Singh and B.J. Kirby
Sandia National Laboratories

*CONTROLLED GROWTH OF SEMICONDUCTOR NANOCRYSTALS IN
MICROFLUIDIC REACTORS*

E.M. Chan¹, A.P. Alivisatos^{1, 2} and R.A. Mathies¹
¹University of California, Berkeley and ²Lawrence Berkeley National Laboratory

PDMS MICROFLUIDIC DEVICES WITH PTFE PASSIVATED CHANNELS

M. Kanai^{1, 2}, D. Uchida², S. Sugjura², Y. Shirasaki², J.S. Go², H. Nakanishi¹,
T. Funatsu² and S. Shoji²,
¹Shimadzu Corporation and ²Waseda University

6:00 pm

Adjourn for the day

Tuesday, October 7, 2003

8:30 - 9:10 am

Plenary III

MICROENGINEERED SYSTEMS TO DIRECTLY MANIPULATE AND PROBE LIVING CELLS

Christopher S. Chen
Johns Hopkins University

9:15 - 10:15 am

Two-Phase
Microfluids I

ORGANIC/AQUEOUS TWO PHASE MICROFLOW FOR BIOLOGICAL SAMPLE PREPARATION

V. Reddy, S. Yang and J.D. Zahn
Pennsylvania State University

MICRO COUNTER-CURRENT FLOW SYSTEM FOR HIGHLY EFFICIENT EXTRACTION

A. Aota¹, M. Nonaka¹, A. Hibara¹ and T. Kitamori^{1, 2}
¹University of Tokyo and ²Kanagawa Academy of Science and Technology

HIGH THROUGHPUT ANALYSIS USING MICROEMULSIONS FOR REAGENT ENCAPSULATION

M. Spaid, A. Chow and Y. Yurkovetsky
Caliper Technologies Corp.

9:15 - 10:15 am

Proteomics I

MICROFLUIDIC REACTOR ARRAY FOR HIGH-THROUGHPUT SCREENING OF PROTEIN CRYSTALLIZATION CONDITIONS

M. Yamada¹, C. Sasaki², T. Isomura³ and M. Seki^{1, 4}
¹University of Tokyo, ²Mitsubishi Chemical Group Science and Technology Research Center, Inc., ³Zoegene Corporation and ⁴Osaka Prefecture University

PROTEIN EXPRESSION BY SIGNATURE PEPTIDES USING MICROFLUIDIC 2D SEPARATION DEVICES

R.S. Foote, J.D. Ramsey, S.C. Jacobson, R.S. Ramsey and J.M. Ramsey
Oak Ridge National Laboratory

INTEGRATED MICROFLUIDICS FOR PARALLEL PROCESSING OF PROTEINS IN A CD MICROLABORATORY

G. Thorsén, G. Ekstrand, U. Selditz, S.R. Wallenborg and P. Andersson
Gyros AB

10:15-10:45 am

Break

10:45-11:45 am

Two-Phase
Microfluids II

FLUIDIC SWITCHING OF HIGH-SPEED AIR-LIQUID TWO-PHASE FLOWS USING ELECTROWETTING-ON-DIELECTRIC

A.H. Tkaczyk¹, D. Huh¹, J.H. Bahng¹, Y. Chang², H.-H. Wei¹, K. Kurabayashi¹, J.B. Grobberg¹, C.-J. Kim² and S. Takayama¹
¹University of Michigan and ²University of California, Los Angeles

LIQUID MIXING USING INERT GAS AND AN INTEGRATED GAS-LIQUID SEPARATOR

A. Günther, M. Jhunjhunwala, M.A. Schmidt and K.F. Jensen
Massachusetts Institute of Technology

POWDER INJECTION ON CHIP

T. Vilknér and A. Manz
Imperial College London

10:45-11:45 am
Proteomics II

PROTEIN CRYSTALLIZATION DEVICE USING ELECTROSTATIC MICROMANIPULATION
M. Hirano¹, T. Torii¹, T. Higuchi¹, M. Kobayashi² and H. Yamazaki³
¹University of Tokyo, ²Riken Harima Institute and ³Techno Medica Co., Ltd.

TWO-DIMENSIONAL GENOMIC AND PROTEOMIC SEPARATIONS IN A PLASTIC MICROFLUIDIC NETWORK
J.S. Buch, Y. Li, F. Rosenberger, D.L. DeVoe and C.S. Lee
University of Maryland

CHIP-LC/MS: HPLC-MS USING POLYMER MICROFLUIDICS
K. Killeen, H. Yin, D. Sobek, R. Brennen and T. van de Goor
Agilent Technologies, Inc.

11:45 am - 1:30 pm

Grab 'N Go Lunch

1:30 - 2:10 pm
Plenary IV

HIGH THROUGHPUT DRUG DISCOVERY
Brian Warrington
GlaxoSmithKline R&D

2:15 - 5:00 pm
Microfluidics

Poster Session
ELECTROKINETICALLY-DRIVEN VORTICAL MOTION FOR MIXING OF LIQUIDS IN A MICROCHANNEL
W.L.W. Hau, L.M. Lee, Y.K. Lee and Y. Zohar
Hong Kong University of Science and Technology

A NOVEL MICROFLUIDIC MIXER BASED ON SUCCESSIVE LAMINATION
M.S. Munson and P. Yager
University of Washington

POWER-FREE MICROFLUIDIC PUMPING BY AIR-EVACUATED PDMS
K. Hosokawa, K. Sato and M. Maeda
RIKEN

SIMPLE FABRICATION OF HYDROPHOBIC SURFACE FOR HIGH-TEMPERATURE MICROSYSTEMS
K. Takahashi¹, T. Ikuta¹, K. Nagayama¹, Y. Takaka¹ and T. Asano²
¹Kyushu University and ²Kyushu Institute of Technology

TRANSPORT AND SIZE FRACTIONATION OF NANO-PARTICLES IN STEPWISE TAPERED NANOMETRIC THIN CHANNELS
D. Clicq, S. Vankrunkelsven, G.V. Baron and G. Desmet
Vrije Universiteit Brussel

MICRONEEDLE ARRAY INTERFACE TO CE ON CHIP
R. Luttge, J.G.E. Gardeniers, E.X. Vrouwe and A. van den Berg
University of Twente

A NOVEL EHD PUMP FOR CONDUCTIVE SOLUTION USING ASYMMETRIC AC FIELD
S. Suzuki and K. Ishikawa
SEIKEI University

REALISATION OF PICOLITER FLOW SWITCHING IN MICROSTRUCTURES USING COMMERCIALY AVAILABLE VALVES
P. Henriksson¹, H. Blom¹, M. Gösch¹, A.-S. Hedman², G. Arvidsson², C. Veider² and R. Rigler¹
¹Karolinska Institute and ²ACREO AB

GLASS-SURFACE AS IN-SITU CATALYST IN REACTION CHIPS

M. Brivio, R.E. Oosterbroek, W. Verboom, M.H. Goedbloed,
A. van den Berg and D.N. Reinhoudt
University of Twente

IN-SITU FABRICATED MICRO CHECK-VALVE UTILIZING THE SPRING FORCE OF A HYDROGEL

D. Kim and D.J. Beebe
University of Wisconsin

A MICROFLUIDIC DEVICE FOR LONG-TERM STUDY OF INDIVIDUAL CELLS

M. Denoual¹, K. Aoki², A. Mita-Tixier¹ and H. Fujita¹
¹*University of Tokyo* and ²*Riken*

*VISUALIZATION AND MEASUREMENT OF RECIRCULATION FLOW IN
NANOLITER-SIZED DROPLET USING MICRO PIV*

H. Kinoshita, M. Oshima, S. Kaneda, T. Fujii, T. Saga and T. Kobayashi
University of Tokyo

*STUDY OF SAMPLE DISPERSION MECHANISMS IN AN ELECTROOSMOTICALLY
PUMPED MICROCHANNEL*

B. Debusschere¹, H. Najm¹, A. Matta², O. Knio², R. Ghanem² and O. Le Maître³
¹*Sandia National Laboratories*, ²*Johns Hopkins University* and
³*Université d'Evry Val d'Essonne*

A MICROFLUIDIC DEVICE FOR PARTIAL SURFACE TREATMENT OF ISLETS OF LANGERHANS

G.M. Walker, D.W. Piston, O.P. McGuinness and J.V. Rocheleau
Vanderbilt University

MODELING CONTROLLED RELEASE FROM CAVITIES IN MICROCHANNEL

E. Garcia, F. Kusmanto, B. Finlayson and P. Yager
University of Washington

POLYMER MICRO INTERFACE FOR FLUIDIC PROBING

S. Matsumoto^{1, 2}, J. Xie¹ and Y.-C. Tai¹
¹*California Institute of Technology* and
²*National Institute of Advanced Industrial Science and Technology*

*FEMTOLITER CHAMBERS FOR THE STUDY OF MECHANICALLY-DRIVEN
ATP SYNTHESIS BY F1 PROTEIN-MOTOR*

Y. Rondelez, G. Tresset, K. Tabata, H. Nitta, S. Takeuchi and H. Noji
University of Tokyo

*CAPTURE-AND-RELEASE CONCENTRATION OF BACTERIA USING
FREE-FLOW ZONE ELECTROPHORESIS*

K.J.Halle¹, J.J. Li¹, M.S. Munson¹, J. Monteith², E. Guzman²,
S. Feather², J. Verba², Q. Porter², V. Kenning², A.E. Kamholz²,
B.H. Weigl³, P. Saltsman³, R. Bardell³ and P. Yager¹
¹*University of Washington*, ²*MesoSystems Technology Inc.* and ³*Micronics, Inc.*

A MICROFABRICATED VISCOMETER

N. Srivastava, R. Davenport and M.A. Burns
University of Michigan

*MONITORING OF COPLANAR POLYCHLORINATED BIPHENYLS (Co-PCB)
BY THE MULTI FLOW ANTIBODY CHIP*

T. Endo¹, A. Okuyama², Y. Matsubara¹, M. Kobayashi¹, Y. Morita¹,
H. Mizukami² and E. Tamiya¹

¹Japan Advanced Institute of Science and Technology and

²EnBioTec Laboratories Co., Ltd.

ULTRA-FAST PRESSURE INJECTION FOR ELECTROPHORESIS SEPARATIONS ON MICROCHIP

D. Solignac, D. Pachoud and M.A.M. Gijs

Swiss Federal Institute of Technology Lausanne

DNA FRAGMENTATION IN A MICROFABRICATED MICROFLUIDIC DEVICE

A. Han, L. Ceriotti, J. Lichtenberg, N.F. de Rooij and E. Verpoorte

University of Neuchâtel

MICROFLUIDIC MIXER USING MAGNETIC BEADS

A. Rida, T. Lehnert and M.A.M. Gijs

Swiss Federal Institute of Technology Lausanne

*LAG AFTER PULSED SEPARATION (LAPS) METER FOR COMPLEX LIQUIDS
IN MICROFLUIDIC SYSTEMS*

S. Sengupta, B. Ziaie and V.H. Barocas

University of Minnesota

*AN ELECTROKINETIC MOBILITY MEASUREMENT TECHNIQUE USING
AC AND DC ELECTROPHORESIS*

M.H. Oddy and J.G. Santiago

Stanford University

OPTIMAL STRATEGIES FOR MOVING DROPLETS IN DIGITAL MICROFLUIDIC SYSTEMS

K.F. Böhringer

University of Washington

*ON-CHIP FIELD AMPLIFIED SAMPLE STACKING UNDER SUPPRESSED
ELECTROOSMOTIC FLOW CONDITIONS*

R. Bharadwaj and J.G. Santiago

Stanford University

*INTEGRATION OF METALLIC MICRONEEDLES WITH DISPOSABLE BIOCHIPS
FOR MINIMALLY INVASIVE BLOOD SAMPLING*

A. Puntambekar, X. Zhu, R. Cole and C.H. Ahn

University of Cincinnati

*A CORIOLIS-BASED SPLIT-AND-RECOMBINE LAMINATOR FOR ULTRAFAST
MIXING ON ROTATING DISKS*

J. Ducreé, T. Brenner, T. Glatzel and R. Zengerle

University of Freiburg

*HIGH-THROUGHPUT ELECTRODELESS DIELECTROPHORESIS OF VIRUSES
IN POLYMERIC MICRODEVICES*

B.H. Lapizco-Encinas, B.A. Simmons, E.B. Cummings and Y. Fintschenko

Sandia National Laboratories

MEMS Technology

NOVEL MICRO GAS GENERATOR OF CARBON DIOXIDE FOR ACTUATION AND GAS SOURCE

Y.H. Choi and S.S. Lee
Pohang University of Science and Technology

LIQUID-PHASE PHOTOPOLYMERIZED MOLDS FOR RAPID FABRICATION OF MICROENVIRONMENTS FOR CELLULAR STUDY

S. Michaels, H. Yu and D.J. Beebe
University of Wisconsin

INVESTIGATION OF ELECTROWETTING-BASED MICROFLUIDICS FOR REAL-TIME PCR APPLICATIONS

M.G. Pollack¹, P.Y. Paik¹, A.D. Shenderov², V.K. Pamula¹, E.S. Dietrich¹ and R.B. Fair¹
¹Duke University and ²Nanolytics Inc.

METAL THIN-FILM MICROPATTERNS TRANSFER ON POLY (DIMETHYLSILOXANE) SUBSTRATE AND ITS APPLICATION TO CAPILLARY ELECTROPHORESIS ELECTROCHEMICAL DETECTION IN MICROCHIP

Y. Park, C. Chen, K. Lim, N. Park, J.H. Kim and J.H. Hahn
Pohang University of Science and Technology

FORMATION OF 3-DIMENSIONAL MICROFLUIDIC COMPONENTS USING DOUBLE-SIDED EXPOSED THICK PHOTORESIST MOLDS

B.-G. Kim, J.-H. Kim and E. Yoon
Korea Advanced Institute of Science and Technology

DEVELOPMENT OF MICRO BEADS SIZE SELECTION CHIP FOR CHEMICAL ARRAY SENSOR

B.H. Park, Y.-S. Sohn and D.P. Neikirk
University of Texas

MICRO MAGNETIC STIR-BARS INTEGRATED IN PARYLENE SURFACE-MICROMACHINED CHANNELS FOR MIXING AND PUMPING

K.S. Ryu, K. Shaikh and C. Liu
University of Illinois, Urbana-Champaign

MICRO PROTEIN FILLER CHIP FOR PROTEIN LIBRARY PRESERVATION AND ARRAYER FILLING IN BATCH

F.-G. Tseng, M.-H. Chen and C.-C. Chieng
National Tsing Hua University

Nanotechnology

A NANOCHANNEL FABRICATION TECHNOLOGY WITHOUT NANOLITHOGRAPHY

C. Lee, E.H. Yang, N.V. Myung and T. George
California Institute of Technology/JPL

MODELING THE TRANSLOCATION OF A SINGLE-MOLECULE DNA THROUGH A NANOPORE VIA CABLE DYNAMICS

Q. Zhu¹, J. Zeng², M.S. Triantafyllou¹ and D.K.P. Yue¹
¹Massachusetts Institute of Technology and ²Coventor Inc.

A PIEZOELECTRIC MICROPUMP BASED ON POLYMERIC MICROMACHINING

N.-T. Nguyen and T.-Q. Truong
Nanyang Technological University

EMERGING PROPERTIES OF NANOCHANNELS

Q. Pu, J. Yun, A. Datta, S. Gangopadhyay, H. Temkin and S. Liu
Texas Tech University

MAGNETO-ELECTROPORATION: ENHANCEMENT AND TARGETING OF GENE TRANSFECTION USING MAGNETIC NANOPARTICLES AND MICROCHIPS

M. Li, Y.-C. Lin, K.-C. Su, M.-I. Liao and C.-S. Yeh
National Cheng Kung University

MICROFLUIDIC IMMOBILIZATION AND PROGRAMMABLE RELEASE OF SINGLE MOLECULES

N. Sundararajan, X. Su and A. Berlin

Intel Research

CELL CULTURE IN MICRODROPS, A NEW FORMAT FOR CELL ON CHIP TECHNOLOGY

B. Schaack, B. Fouqué, S. Porte, S. Combe, A. Hennino,

O. Filhol-Cochet, J. Reboud, M. Balakirev and F. Chatelain

CEA

CONTINUOUS REAL-TIME MONITORING OF QUANTUM DOT SYNTHESIS

WITHIN MICROFLUIDIC REACTORS

J.B. Edel, S. Krishnadasan, J.T. Cao-Romero, R. Vilar, J.C. de Mello and A.J. de Mello

Imperial College London

3D NANO-ELECTRODES FOR VISUALIZING SINGLE MOLECULAR DYNAMICS

T. Yamamoto and T. Fujii

University of Tokyo

NANO CHEMICAL REACTOR

E. Tamaki¹, Y. Morita¹, A. Hibara¹, H.B. Kim¹, M. Tokeshi², T. Ooi¹,

M. Nakao¹ and T. Kitamori^{1, 2, 3}

¹University of Tokyo, ²Kanagawa Academy of Science and Technology and

³Japan Science and Technology Corporation

CARBON NANOTUBE BASED MICROFLUIDIC ELEMENTS FOR FILTRATION AND CONCENTRATION

O. Bakajin, N.B. Barak, J. Peng and A. Noy

Lawrence Livermore National Laboratory

MANIPULATING SELF-ASSEMBLED NANOTUBES

K.P. Brazhnik, W.N. Vreeland, P.B. Howell, R. Kishore, J. Wells,

K. Helmersen and L.E. Locascio

National Institute of Standards and Technology

NANOCAPILLARY ARRAY INTERCONNECTS IN MULTILAYER MICROCHIPS FOR TRANSPORT CONTROL BETWEEN DIFFERENT FLUIDIC ENVIRONMENTS

D.M. Cannon Jr., B.R. Flachsbar, J.J. Tulock, P.W. Bohn,

M.A. Shannon and J.V. Sweedler

University of Illinois, Urbana-Champaign

PLANAR NANOGAP CAPACITOR ARRAYS ON QUARTZ FOR OPTICAL AND DIELECTRIC BIOASSAY

H.K. Kang, J. Seo, D. DiCarlo, Y.-K. Choi and L.P. Lee

University of California, Berkeley

POLYELECTROLYTE TRANSPORT IN NANOCONFINED CHANNELS

N.J. Petersen, J.P. Alarie, S.C. Jacobson and J.M. Ramsey

Oak Ridge National Laboratory

NANOPILLAR SUBSTRATE FOR SERS

G.L. Liu, Y.-K. Choi, S. Kwon and L.P. Lee

University of California, Berkeley

NANOFLUIDIC CHANNEL FABRICATION BY NANOIMPRINT LITHOGRAPHY

X. Cheng¹, L.J. Guo¹ and C.-F. Chou²

¹University of Michigan and ²Arizona State University

Applications

PATTERNING RETINAL CELLS ON POLYELECTROLYTE MULTILAYERS

D.R. Reyes¹, E. Perruccio², S.P. Becerra², L.E. Locascio¹ and M. Gaitan¹

¹National Institute of Standards and Technology and ²National Institutes of Health

POLYMER-BASED MODULAR MICROSYSTEMS FOR DNA SEQUENCING

S.A. Soper¹, W. Stryjewski¹, L. Zhu¹, Y. Xu¹, M. Wabuye¹,

H. Chen², M. Galloway¹ and R.L. McCarley¹

¹Louisiana State University and ²Zhejiang University

PURIFICATION OF HUMAN GENOMIC DNA FROM A SINGLE HAIR ROOT ON

A MICRODEVICE AND DIRECT AMPLIFICATION OF ITS D1S80 LOCUS

N.Y. Lee¹, M. Yamada¹ and M. Seki²

¹University of Tokyo and ²Osaka Prefecture University

MICROFABRICATED FLOW-THROUGH PCR DEVICE FOR IN SITU GENE ANALYSIS
IN EXTREME ENVIRONMENTS

T. Fukuba¹, T. Naganuma² and T. Fujii¹

¹University of Tokyo and ²Hiroshima University

MICROCHIPS FOR CELL-TYPE IDENTIFICATION

Y.-C. Lin¹, M. Li¹, C.-Y. Wu¹, W.-C. Hsiao¹ and Y.-C. Chung²

¹National Cheng Kung University and ²Industrial Technology Research Institute

TWO-DIMENSIONAL GRADIENT GENERATION USING MICROFLUIDIC CHAMBER ARRAY

M. Yamada¹, M. Nakashima¹, N.Y. Lee¹ and M. Seki²

¹University of Tokyo and ²Osaka Prefecture University

ON-CHIP DNA TRAPPING AND PRECONCENTRATION EMPLOYING
RECIRCULATING FLOWS DEVICES

G.-L. Lettieri, L. Ceriotti, N.F. de Rooij and E. Verpoorte

University of Neuchâtel

PAINLESS BLOOD COLLECTION SYSTEM EQUIPPING DETECTION
FUNCTIONS FOR SEARCH OF VEIN

H. Ogawa¹, M. Nagai¹, J. Kikuchi² and Y. Horiike³

¹Japan Science and Technology Corp., ²Axiomatec Inc. and

³National Institute for Materials Science

SILICON MICROCHAMBER ARRAY FOR SEQUENCE-SPECIFIC DNA AMPLIFICATION AND
DETECTION USING A NOVEL DISPENSING METHOD

Y. Matsubara, M. Kobayashi, Y. Morita and E. Tamiya

Japan Advanced Institute of Science and Technology

GEL-FREE ELECTROPHORESIS OF λ - AND T2-DNA IN STRUCTURED PDMS
MICROFLUIDIC DEVICES

T.T. Duong, M. Streek, R. Ros, F. Schmid, A. Ros and D. Anselmetti

Bielefeld University

CELLULAR GENOMIC ANALYSIS WITH GMR SENSOR ARRAYS

C.R. Tamanaha¹, S.P. Mulvaney¹, K.A. Wahowski², M.C. Tondra³,

L.J. Whitman¹ and R.J. Colton¹

¹Naval Research Laboratory, ²Nova Research, Inc. and ³NVE Corporation

CONTINUOUS CULTURE AND MONITORING OF SELECTED AND ISOLATED MICROORGANISMS ON A CHIP USING THERMAL GELATION

F. Arai^{1, 2}, A. Ichikawa¹, T. Fukuda¹ and T. Katsuragi³

¹Nagoya University, ²PRESTO, JST and ³Nara Institute of Science and Technology

IN-VIVO MEASUREMENT OF pH IN DIGESTIVE SYSTEM THROUGH WIRELESS COMMUNICATION

A. Oki¹, T. Yamada², H. Nakase³, H. Uesugi², K. Tsubouchi³, K. Masu² and Y. Horiike¹

¹National Institute for Materials Science, ²Tokyo Institute of Technology and ³Tohoku University

MONITORING AND CONTROL OF CELL GROWTH IN FED-BATCH MICROBIOREACTORS

Z. Zhang, N. Szita, P. Boccazzi, A.J. Sinskey and K.F. Jensen
Massachusetts Institute of Technology

PHOTOCONTROLLED FLUID FLOWS BY PHOTORESPONSIVE SPIROBENZOPYRAN-COATED SURFACE IN MICROCHANNELS

T. Koide¹, G. Takei¹, T. Kitamori^{1, 2} and H.-B. Kim¹

¹University of Tokyo and ²Kanagawa Academy of Science and Technology

MINIATURIZED ELECTROPORATING DEVICE FOR CONTROLLED CELL LYSIS

H. Lu, S. Gaudet, P.K. Sorger, M.A. Schmidt and K.F. Jensen
Massachusetts Institute of Technology

MICRO LIVER SYSTEM FOR BIOREACTOR AND BIOCONVERSION

Y. Tanaka^{1, 2}, K. Sato^{1, 2, 3}, M. Yamato^{2, 4}, T. Okano^{2, 4} and T. Kitamori^{1, 2, 3}

¹University of Tokyo, ²Japan Science and Technology Corp., ³Kanagawa Academy of Science and Technology and ⁴Tokyo Women's Medical University

MULTICHANNEL MICRO ELISA SYSTEM

K. Sato^{1, 2, 3}, M. Yamanaka¹, M. Tokeshi², K. Morishima² and T. Kitamori^{1, 2, 3}

¹University of Tokyo, ²Kanagawa Academy of Science and Technology and ³Japan Science and Technology Corporation

DEVELOPMENT OF MICROCHIP-BASED BIOASSAY SYSTEM USING CULTURED CELLS

M. Goto¹, K. Sato^{1, 2, 3}, M. Tokeshi² and T. Kitamori^{1, 2, 3}

¹University of Tokyo, ²Kanagawa Academy of Science and Technology and ³Japan Science and Technology Corporation

METHODS FOR HIGH-SPEED, EFFICIENT PURIFICATION OF NUCLEIC ACIDS FROM DIVERSE CLINICAL AND BIO-HAZARDOUS SAMPLES ON GLASS AND HYBRID PDMS-GLASS MICROCHIPS

J.M. Bienvenue, J.M. Karlinsey, Q. Wu, R.D. McConnell, J.P. Ferrance, P.M. Norris and J.P. Landers
University of Virginia

PRINTED CIRCUIT BOARD BASED OCEANOGRAPHIC MICROFLUIDIC SYSTEMS

D. Fries, M.H. Broadbent, M.L. Janowiak, A.M. Cardenas-Valencia, S. Ivanov, R. Benson, and G. Steimle
University of South Florida

Detection Technologies

DEVELOPMENT OF INEXPENSIVE BIOSENSOR ARRAY FOR POINT-OF-CARE TESTING
C. Gao, X. Zhu, M. Dutta, S. Chilukuru, J.H. Nevin, J.W. Choi and C.H. Ahn
University of Cincinnati

A NOVEL DYNAMIC ELECTROCHEMICAL TRANSDUCTION MECHANISM FOR
LOW CONCENTRATION ANALYTE DETECTION
X. Zhu, C. Gao, J. Kai, J. Do, J.W. Choi and C.H. Ahn
University of Cincinnati

HIGH-PRECISION CHARACTERIZATION OF EMBRYO POSITIONING FORCE USING
MEMS OPTICAL ENCODER
X.J. Zhang¹, S. Zappe¹, R.W. Bernstein², C.-C. Chen¹, O. Sahin¹,
M. Scott¹ and O. Solgaard¹
¹Stanford University and ²SINTEF Electronics and Cybernetics

INTEGRATION OF A FLOW REGIME SENSOR INTO A THREE-DIMENSIONAL
MULTICHANNEL MICROREACTOR
T. Kraus, N. de Mas, A. Günther, M.A. Schmidt and K.F. Jensen
Massachusetts Institute of Technology

COMPACT AND MULTIPLE SURFACE-PLASMON-RESONANCE IMMUNOSENSOR
FOR SUB-PPB-LEVEL SMALL MOLECULES
H. Kawazumi¹, S. Yasunaga¹, K. Ogino², H. Maeda², K.V. Gobi³ and N. Miura³
¹Kinki University, ²National Institute of Advanced Industrial Science and Technology and
³Kyushu University

ULTRASENSITIVE DETECTION OF ELECTROCHEMICAL REACTIONS
BY THERMAL LENS MICROSCOPY FOR MICROCHIP CHEMISTRY
H.-B. Kim¹, T. Hagino¹, N. Sasaki¹ and T. Kitamori^{1,2}
¹University of Tokyo and ²Kanagawa Academy of Science and Technology

TRANSMISSION MICRO PIV RESOLVING VELOCITIES NORMAL TO THE FOCAL PLANE
L. Bitsch¹, L.H. Olesen¹, C.H. Westergaard², H. Bruus¹, H. Klank¹ and J.P. Kutter¹
¹Technical University of Denmark and ²Dantec Dynamics A/S

MICRO PIV ON BLOOD FLOW IN A MICROCHANNEL
L. Bitsch¹, L.H. Olesen¹, C.H. Westergaard², H. Bruus¹, H. Klank¹ and J.P. Kutter¹
¹Technical University of Denmark and ²Dantec Dynamics A/S

VERTICAL CAVITY ENHANCED SPECTROSCOPY FOR MICROFLUIDIC STRUCTURES
M.L. Adams, S.R. Quake and A. Scherer
California Institute of Technology

INTEGRATION OF HETEROGENEOUS BIOSENSORS ON MICROFLUIDIC CHIP
USING SURFACE PLASMON RESONANCE
Y. Iwasaki and O. Niwa
NTT Microsystem Integration Laboratories

SIMPLE ELECTRO SPRAY IONIZATION MASS-SPECTROMETRY COUPLING
FOR ORGANIC SYNTHESIS ANALYSIS IN MICROREACTORS
R.E. Oosterbroek, M. Brivio, M.H. Goedbloed, P. Guatteri,
D.N. Reinhoudt and A. van den Berg
University of Twente

OPTIMIZATION OF SIGNAL-TO-NOISE RATIO IN ABSORBANCE DETECTION
BY INTEGRATION OF MICROOPTICAL COMPONENTS
D. Snakenborg, K.B. Mogensen and J.P. Kutter
Technical University of Denmark

5:00 – 6:00 pm
Separations II

ELECTROKINETIC PARTICLE SEPARATION

S. Devasenathipathy¹, J.G. Santiago¹, T. Yamamoto², Y. Sato² and K. Hishida²
¹Stanford University and ²Keio University

INTEGRATING MULTIPLIED PCR WITH CE FOR DETECTING MICROORGANISMS

Z.H. Fan^{1, 2}, A.J. Ricco^{2, 3}, W. Tan², M.-Q. Zhao² and C.G. Koh²
¹University of Florida, ²ACLARA BioSciences and ³NASA Ames Research Center

FACETED MICRO-CHANNELS FOR LOW-DISPERSION ELECTROKINETIC FLOWS

G.J. Fiechtner and E.B. Cummings
Sandia National Laboratories

5:00 – 6:00 pm
Fabrication

LAB-ON-CHIP SYSTEM FOR MEASURING FLUID DENSITY AND CHEMICAL CONCENTRATION

D. Sparks, R. Smith, A. Chimbayo, R. Schneider, J. Cripe,
S. Massoud-Ansari and N. Najafi
Integrated Sensing Systems Inc.

*A MICRO/NANO-FLUIDIC CHIP-BASED MICRO-WELL ARRAY FOR HIGH-THROUGHPUT
CELL ANALYSIS AND DRUG SCREENING*

K.-S. Yun and E. Yoon
Korea Advanced Institute of Science and Technology

INTEGRATED PARYLENE ELECTROSTATIC PERISTALTIC PUMP

J. Xie, J. Shih and Y.-C. Tai
California Institute of Technology

6:00 pm

Adjourn for the day

Wednesday, October 8, 2003

8:30 - 9:10 am

Plenary V

DNA MANIPULATION IN ELECTROSTATIC FIELD

Masao Washizu
University of Tokyo

9:15 - 10:15 am

Fluidics I

A NOVEL MICROINJECTION SYSTEM BY FUSING A GLASS NEEDLE AND A PDMS-BASED VALVE WITH A RIGID CENTER MEMBRANE

S.H. Lee¹ and D.J. Beebe²
¹Dankook University and ²University of Wisconsin

PARTICLE FLOW SWITCH UTILIZING ULTRASONIC PARTICLE SWITCHING IN MICROFLUIDIC CHANNELS

F. Petersson, A. Nilsson, H. Jönsson and T. Laurell
Lund Institute of Technology

AN OSCILLATING FERROMAGNETIC MICROPUMP UTILIZING CENTRIFUGAL FORCE

J. Atencia and D.J. Beebe
University of Wisconsin

9:15 - 10:15 am

Proteomics III

A CAPILLARY FILLING MICROSYSTEM FOR SOLID-PHASE EXTRACTION AND DISPENSING OF PROTEOMIC SAMPLES

L. Wallman¹, S. Ekström¹, J. Nilsson¹, G. Marko-Varga² and T. Laurell¹
¹Lund Institute of Technology and ²AstraZeneca Research & Development

MICROSECOND MICROFLUIDIC MIXING FOR INVESTIGATION OF PROTEIN FOLDING KINETICS

D.E. Hertzog^{1, 2}, J.G. Santiago¹ and O. Bakajin²
¹Stanford University and ²Lawrence Livermore National Laboratory

COLORIMETRIC ANALYSIS CHIP CHECKING HEPATIC FUNCTIONS

A. Yokogawa¹, A. Oki², T. Shimasaki¹, H. Takasu¹ and Y. Horiike²
¹Rohm Co., Ltd. and ²National Institute for Materials Science

10:15 - 10:45 am

Break

10:45 - 11:45 am

Fluidics II

FIELD EFFECT FLOW CONTROL IN A POLYMER T-INTERSECTION MICROFLUIDIC NETWORK

N.J. Sniadecki¹, R. Chang¹, M. Beamesderfer², C.S. Lee¹ and D.L. DeVoe¹
¹University of Maryland and ²NASA Goddard

A FLOW SWITCH BASED ON CORIOLIS FORCE

T. Brenner, T. Glatzel, R. Zengerle and J. Duerce
University of Freiburg

ON-DEVICE DILUTION TO FIVE LOGS WITH INCREASED THROUGHPUT

ON A LabCD™: APPLICATION TO INHIBITION ASSAYS
G.J. Kellogg and T.J. Johnson
Tecan Boston

10:45 - 11:45 am
Cells III

A MICROELECTRONIC CHIP OPENS NEW FIELDS IN RARE CELL POPULATION ANALYSIS & INDIVIDUAL CELL BIOLOGY
A. Fuchs¹, N. Manaresi², D. Freida¹, L. Altomare³, C.L. Villiers¹, G. Medoro², A. Romani³, I. Chartier¹, C. Bory¹, M. Tartagni³, P.N. Marche¹, F. Chatelain¹ and R. Guerrieri³
¹CEA, ²Silicon Biosystems and ³University of Bologna

MICRO ISOELECTRIC FREE FLOW SEPARATION OF SUBCELLULAR MATERIALS
H. Lu, S. Gaudet, P.K. Sorger, M.A. Schmidt and K.F. Jensen
Massachusetts Institute of Technology

PROGRAMMABLE DIELECTROPHORETIC μ TAS SAMPLE HANDLING
P.R.C. Gascoyne¹, J.V. Vykoukal¹, T. Anderson¹, J. Noshari¹, F.F. Becker¹, K. Ratanachoo², K. Kandjanapa², J. Satayavivad² and M. Ruchirawat²
¹University of Texas M.D. Anderson Cancer Center and ²Chulabhorn Research Institute

11:45-11:50 am

Announcement of Denmark 2004

11:50 am-1:30 pm

Grab 'N Go Lunch

1:30 - 4:15 pm
Microfluidics

Poster Sessions
BIOSENSOR PERFORMANCE ENHANCEMENT THROUGH AC ELECTROKINETICS
M. Sigurdson, C.D. Meinhart, X. Liu and D. Wang
University of California, Santa Barbara

MICRO OPTICAL SWITCHING VALVE SYSTEM BASED ON REVERSIBLE WETTABILITY CONVERSION
H. Nagai¹, J. Takahashi² and S. Wakida¹
¹National Institute of Advanced Industrial Science and Technology and
²Daikin Environmental Laboratory, Ltd.

HIGH-YIELD BURIED MICROCHANNEL FORMATION FOR DRUG DELIVERY AT THE CELLULAR LEVEL
Y. Li, N. Gulari and K.D. Wise
University of Michigan

MIXING AND FILTERING IN A CROSS-CHANNEL INTERSECTION
A. Dodge¹, M.-C. Jullien², F. Okkels¹ and P. Tabeling¹
¹ESPCI and ²ENS-Cachan

ACOUSTIC STREAMING — ULTRASONIC AGITATION IN MICROCHANNELS
M. Bengtsson and T. Laurell
Lund Institute of Technology

MEASUREMENT OF FAST KINETICS IN A MICROFLUIDIC SYSTEM
C. Baroud¹, L. Menetrier², F. Okkels² and P. Tabeling²
¹Ecole Polytechnique and ²ESPCI

SURFACE MOUNT MICROFLUIDIC FLOW REGULATOR ON A POLYMER SUBSTRATE
M.J. Mescher, C.E. Dubé, M. Varghese and J.O. Fiering
Charles Stark Draper Laboratory

THE EFFECT OF SURFACE CHARACTER ON FLOWS IN CYLINDRICAL MICROCHANNELS
L.E. Rodd¹, G. Rosengarten¹, S.T. Huntington¹, K. Lytikainen², D.V. Boger¹ and J.J. Cooper-White¹
¹University of Melbourne and ²University of Sydney

ON-CHIP IEF PEAK MANIPULATION FOR 2D PROTEIN SEPARATION AND MS COUPLING
Y.-C. Wang, M.H. Choi and J. Han
Massachusetts Institute of Technology

SOFT EMBOSSED MICROFLUIDIC DEVICES
B.L. Carvalho, E.A. Schilling, N. Schmid and G.J. Kellogg
Tecan Boston

NANOJET CONTROLLED DROPLET EMULSION IN MICROFLUIDIC CHANNELS
Y.-C. Tan, J. Collins and A.P. Lee
University of California, Irvine

T-SENSOR GENERATED REFRACTIVE INDEX GRADIENTS:
CALIBRATION OF AN SPR MICROSCOPE
J. Foley, E. Fu and P. Yager
University of Washington

ULTRAFAST ON-CHIP SEPARATIONS OF CYTOKINES BY
SDS-PAGE USING UV-INITIATED POLYACRYLAMIDE
R. Shediach, S.A. Pizarro, A.E. Herr and A.K. Singh
Sandia National Laboratories

A NOVEL MICRODISPENSER ARRAY FOR ACCURATE OFF-CHIP
DISPENSING FOR MICROARRAY APPLICATIONS
A. Puntambekar and C.H. Ahn
University of Cincinnati

HOMOGENEOUS IMMUNOASSAY FOR DETECTION OF TNT AND ITS ANALOGUES
ON A MICROFABRICATED CAPILLARY ELECTROPHORESIS CHIP
A. Bromberg and R.A. Mathies
University of California, Berkeley

ELECTROKINETIC MICROFLOW INSTABILITY WITH CONDUCTIVITY GRADIENTS
C.-H. Chen, H. Lin, S.K. Lele and J.G. Santiago
Stanford University

OPTIMIZATION OF ISOTACHOPHORESIS COUPLED WITH GEL ELECTROPHORESIS IN
MICROFLUIDIC DEVICES FOR HIGH THROUGHPUT SCREENING APPLICATIONS
C. Park, P. Kechagia, R.-L. Chien and M. Spaid
Caliper Technologies Corp.

AUTOMATED ELECTROWETTING BASED DROPLET DISPENSING
WITH GOOD REPRODUCIBILITY
H. Ren, V. Srinivasan, M. Pollack and R.B. Fair
Duke University

CHARACTERIZATION OF PIEZOELECTRIC MICROPUMP DRIVEN BY TRAVELING WAVES
I. Kanno¹, S. Kawano², S. Yakushiji¹ and H. Kotera¹
¹Kyoto University and ²Tohoku University

A THREE-DIMENSIONAL MICROFLUIDIC NETWORK FOR CELLULAR PERFUSION
Y. Choi, R. Powers, Y.-K. Yoon and M.G. Allen
Georgia Institute of Technology

REDUCTION OF MICROFLUIDIC END EFFECTS IN MICRO-FIELD
FLOW FRACTIONATION CHANNELS
J.W. Kim, H.J. Sant and B.K. Gale
University of Utah

PASSIVE MIXING AND THE FLOW CHARACTERISTIC OF A H-TYPE MICROCHANNEL
I.D. Yang, Y.F. Chen, H.T. Hsu, F.G. Tseng and C.C. Chieng
National Tsing Hua University

FLUIDICS RESOLVED ANALYSIS OF PROTEIN ADSORPTION IN A BIOMICROFLUIDIC SYSTEM
J. Jenkins¹, B. Prabhakarandian¹, K. Lenghaus², J. Hickman² and S. Sundaram¹
¹CFD Research Corporation and ²Clemson University

A NOVEL BIOPARTICLE SEPARATION TECHNIQUE USING SEQUENTIAL PRESSURE PULSES
A. Jain, A. Puntambekar and C.H. Ahn
University of Cincinnati

RP-HPLC MICROCHIP SEPARATIONS WITH SUBNANOLITER ON-CHIP PRESSURE INJECTIONS
D.S. Reichmuth, T.J. Shepodd and B.J. Kirby
Sandia National Laboratories

SURFACE MICROMACHINED HOLLOW MICRONEEDLE ARRAY INTEGRATED ON A MICROFLUIDIC CHIP
T. Ichiki^{1,2}, Y. Sugiyama¹, S. Kase^{1,2} and Y. Horiike³
¹Toyo University, ²Japan Science and Technology Corporation and ³National Institute for Materials Science

LIQUID SLUG TRANSPORT, SYNCHRONIZATION AND MIXING DRIVEN BY FERROFLUIDS
O. Sørensen, K.S. Drese and S. Hardt
Institut für Mikrotechnik Mainz GmbH

DEVELOPMENT OF MICRO NEEDLE-HEAD SLIDE VALVE UNIT FOR MICROFLUIDIC DEVICES
K. Morishima¹, M. Ohnishi¹, M. Tokeshi¹ and T. Kitamori^{1,2,3}
¹Kanagawa Academy of Science and Technology, ²University of Tokyo and ³Japan Science and Technology Corporation

PATCH-CLAMP ARRAY WITH ON-CHIP ELECTRONICS, OPTICS, FLOW CONTROL AND MECHANICAL ACTUATION
M. Okandan, C. James, S.S. Mani and B.L. Draper
Sandia National Laboratories

CHEMISTRY AT LIQUID-LIQUID INTERFACES
N.O.L. Viernes and J.S. Moore
University of Illinois, Urbana-Champaign

MAGF: A NEW METHOD FOR HIGH-PERFORMANCE FOCUSING OF UNCHARGED AND HYDRPHOBIC ANALYTES
D. Ross, K.M. Balss, P.B. Howell and W.N. Vreeland
National Institute of Standards and Technology

A RECONFIGURABLE INTEGRATED DEVICE FOR BIOASSAY DEVELOPMENT
G.A. Mensing, D. Kim, J. Moorthy, J.I. Bassett, D.T. Eddington and D.J. Beebe
University of Wisconsin

FABRICATION OF THROUGH-WAFER FLUID INTERCONNECTS WITH LOW DEAD VOLUME AND INTEGRATED BACK-PLANE FLUID JUMPERS
K. Shaikh, K.S. Ryu, Z. Fan and C. Liu
University of Illinois, Urbana-Champaign

USE OF CONDUCTIVITY ELECTRODES AS ON-CHIP SENSORS IN CHROMATOGRAPHIC MICROFLUIDIC DEVICES
R. Rocklin¹, H. Yin¹, D. Sobek¹, P. Coufal² and K. Killen¹
¹Agilent Technologies Inc. and ²Charles University

MEMS Technology

Materials

A NOVEL SYSTEM FOR MEASUREMENT OF ELECTROPHYSIOLOGICAL SIGNALS ASSOCIATED WITH TRAUMATIC NEURONAL INJURY

J. Ross, G. Prado, Y. Choi, M. Allen, M. LaPlaca and S. DeWeerth
Georgia Institute of Technology

MICRO-PHYSIOMETRY TOOLS FOR CELL ANALYSIS AND CELL SEPARATIONS

R. Pethig, M.S. Talary, R.S. Lee, B. Kusler and C. Carswell-Crumpton
Aura BioSystems, Inc.

ON THE IMPORTANCE OF QUALITY CONTROL IN MICROFLUIDIC DEVICE MANUFACTURING

M.R. Steedman, K.M. Lloyd, A. Hatch, M.S. Munson and P. Yager
University of Washington

ACTIVE LAB-ON-CHIP WITH A DISPOSABLE FLUIDIC SYSTEM

R.A. Buser
University of Applied Science Buchs

PRECONCENTRATION OF PROTEINS ON CHIP USING A PHOTOINITIATED POLYMER MONOLITH CONTAINING IMMOBILIZED TANNIC ACID

L.M. Barrett^{1,2}, F. Svec³ and Y. Fintschenko²
¹Loughborough University, ²Sandia National Laboratories and
³University of California, Berkeley

NOVEL SURFACE MODIFICATION METHODS AND SURFACE PROPERTY ANALYSIS FOR SEPARATION OF DNA BIO-MOLECULES USING CAPILLARY ELECTROPHORESIS

C.-H. Lin¹, L.-M. Fu², K.-H. Lee³, R.-J. Yang³ and G.-B. Lee³
¹National Sun Yat-Sen University, ²National Pingtung University of
Science and Technology and ³National Cheng Kung University

SURFACE MODIFICATION OF SiO₂ MICRONOZZLES FOR PATCH-CLAMP MEASUREMENTS ON-CHIP

T. Lehnert, A. Laine, M.A.M. Gijs
Swiss Federal Institute of Technology Lausanne

DEVELOPMENT OF PROCESS PROTOCOLS TO FINE TUNE POLYDIMETHYLSILOXANE MATERIAL PROPERTIES

D.T. Eddington, W.C. Crone and D.J. Beebe
University of Wisconsin

SURFACE CHARACTERIZATION AND A LIFT-OFF PROCESS OF A FLUOROCARBON THIN FILM FOR MICRO PROTEIN PATTERNING

S.-H. Lee, C.-S. Lee, B.-G. Kim and Y.-K. Kim
Seoul National University

POROUS SILICON AS SUBSTRATE FOR HIGH SENSITIVITY PROTEIN CHIPS

A. Ressine¹, G. Marko-Varga² and T. Laurell¹
¹Lund Institute of Technology and ²Lund University

PROTEIN MICROARRAY ON CYCLIC OLEFIN COPOLYMER (COC) FOR DISPOSABLE PROTEIN LAB-ON-A-CHIP

J. Kai, Y.S. Sohn and C.H. Ahn
University of Cincinnati

POLY (ETHYLENE GLYCOL) (PEG)-MODIFIED POLY (DIMETHYLSILOXANE) (PDMS) FOR PROTEIN- AND CELL-RESISTANT SURFACES IN MICROBIOREACTOR

H.-G. Choi¹, Z. Zhang¹, P. Boccazzi¹, P.E. Laibinis², A.J. Sinskey¹ and K.F. Jensen¹
¹Massachusetts Institute of Technology and ²Rice University

PARYLENE TECHNOLOGY FOR MECHANICALLY ROBUST NEUROCAGES
E. Meng, Y.-C. Tai, J. Erickson and J. Pine
California Institute of Technology

UV ADHESIVE BONDING TECHNIQUES AT ROOM TEMPERATURE
FOR PLASTIC LAB-ON-A-CHIPS
J. Han, S. Lee, A. Puntambekar, S. Murugesan, J.-W. Choi,
G. Beaucage and C.H. Ahn
University of Cincinnati

SUB HYDROPHILIC MODIFICATION BY FORMING COPOLYMER
WITH HYDROPHILIC EPOXY MOLECULE
C.-L. Wu, M.-H. Chen and F.-G. Tseng
National Tsing Hua University

IMPROVEMENT OF ELECTROOSMOTIC FLOW CHARACTERISTIC IN POLY
(DIMETHYLSILOXANE) CHANNELS VIA A LONG LIFE CHEMICAL SURFACE MODIFICATION
E.S. Choi and S.S. Yang
Ajou University

BIO ACTUATED MICROSYSTEM USING CULTURED CARDIOMYOCYTES
K. Morishima¹, Y. Tanaka², K. Sato^{2,3}, M. Ebara⁴, T. Shimizu⁵,
M. Yamato⁵, A. Kikuchi⁵, T. Okano⁵ and T. Kitamori^{1, 2,3}
¹Kanagawa Academy of Science and Technology, ²University of Tokyo,
³Japan Science and Technology Corporation, ⁴Waseda University and
⁵Tokyo Women's Medical University

AUTOMATIC TRANSPORTATION OF A DROPLET ON A WETTABILITY GRADIENT SURFACE
T. Yasuda¹, K. Suzuki² and I. Shimoyama²
¹Kyushu Institute of Technology and ²University of Tokyo

Applications

CONNECTIVELY DRIVEN POLYMERASE CHAIN REACTION THERMAL CYCLER
E.K. Wheeler, B. Benett, P. Stratton, J. Richards, A. Christian, A. Chen,
T. Weisgraber, K. Ness, J. Ortega and F. Milanovich
Lawrence Livermore National Laboratory

REMOVAL OF PCR INHIBITORS USING DIELECTROPHORESIS FOR SAMPLE
PREPARATION IN A MICROFABRICATED SYSTEM
A. Wolff¹, I.R. Perch-Nielsen¹, C.R. Poulsen¹, J. El-Ali¹ and D.D. Bang²
¹Technical University of Denmark and ²Danish Veterinary Institute

TEMPERATURE GRADIENT FOCUSING OF MATCHED AND PARTIALLY MISMATCHED
DNA/PNA HYBRIDIZATIONS
K.M. Balss, D. Ross and M.J. Tarlov
National Institute of Standards and Technology

DIELECTROPHORETIC FOCUSING AND SEPARATION OF NANOPARTICLES:
EXPERIMENTAL MEASUREMENT AND NUMERICAL SIMULATION
N.G. Green, D. Holmes and H. Morgan
University of Glasgow

IMAGING FOR DEGRADATION OF IKB-EGFP IN A SINGLE JURKAT T CELL
STUDIED WITHIN A MICROFLUIDIC CHANNEL
P.C.H. Li, L. de Camprieu and M. Sangar
Simon Fraser University

DIELECTROPHORESIS BASED MICRO FLOW CYTOMETRY

J. Vykoukal¹, J.A. Schwartz¹, P.R.C. Gascoyne¹, C. Yu² and L. Shi²

¹University of Texas M.D. Anderson Cancer Center and ²University of Texas, Austin

*PROTOTYPE OF A MULTIPLE REACTIONS DNA ANALYSIS DEVICE WITH
A VERSATILE MICROFLUIDIC SAMPLE MANIPULATOR*

M.-B. Yim, R. Lin, M. Yang, B.N. Johnson, D.T. Burke and M.A. Burns

University of Michigan

GRADIENT-ELUTION REVERSED-PHASE ELECTROCHROMATOGRAPHY IN MICROCHIPS

A.K. Singh, D.J. Throckmorton, J.S. Brennan and T.J. Shepodd

Sandia National Laboratories

MONITORING OF SUBCELLULAR FUNCTIONS ON MICROCHIP

J. Dragoljic and D.J. Harrison

University of Alberta

ELECTROKINETIC PRECONCENTRATION OF PROTEINS ON THIN PDMS MEMBRANES

S.M. Kim and E.F. Hasselbrink, Jr.

University of Michigan

PROTEASE DIFFUSION AND REACTION OF IMMOBILIZED SUBSTRATE SURFACES

S. Roy¹, J.T. Kellis², A.J. Polouse², C.R. Robertson¹ and A.P. Gast³

¹Stanford University, ²Genencor International Inc. and

³Massachusetts Institute of Technology

CHIP-BASED RISK EVALUATION SYSTEM FOR CHEMICALS USING E.COLI

M. Tokeshi¹, S. Hiki², Y. Akiyama², K. Morishima¹, K. Sato³ and T. Kitamori^{1, 3}

¹Kanagawa Academy of Science and Technology,

²Institute of Microchemical Technology and ³University of Tokyo

SIZE DEPENDENT MOBILITY OF DNA IN ELECTRIC AND HYDRO DRAG FORCE FIELD

Y. Takamura¹, Y. Horiike², Y. Baba³ and E. Tamiya¹

¹Japan Advanced Institute of Science and Technology,

²National Institute of Materials Science and ³University of Tokushima

*ENHANCED BROWNIAN RATCHET ARRAY FOR DNA SEPARATION USING
FLOW ANGLE OPTIMIZATION*

L.R. Huang, J.C. Sturm, R.H. Austin and E.C. Cox

Princeton University

*HIGH THROUGHPUT SEPARATIONS USING A MICROFABRICATED
SERIAL ELECTRIC SPLIT SYSTEM*

S. Merugu, N. Narayanan and B.K. Gale

University of Utah

A MICRO-GAP SENSOR BASED ON CONDUCTING POLYPYRROLE

K.-S. Teh and L. Lin

University of California, Berkeley

MICROFABRICATED CYCLICAL ELECTRICAL FIELD FLOW FRACTIONATION

A.S. Kantak, S. Merugu and B.K. Gale

University of Utah

*RAPID GENOTYPING WITH INTEGRATED CONTINUOUS-FLOW PCR
AND BIOELECTRONIC DETECTION*

C.-F. Chou¹, R. Lenigk¹, D. Sadler², R. Changrani³,

S. O'Rourke¹, R. Liu¹ and F. Zenhausern¹

¹Arizona State University, ²Motorola Labs and ³Northwestern University

Detection Technologies

SEPARATION OF BIOPARTICULATE MATTER USING TRAVELING WAVE DIELECTROPHORESIS
K. Pant, J. Feng, G. Wang, S. Krishnamoorthy and S. Sundaram
CFD Research Corporation

2 1/2 D MICROFABRICATED NIB-LIKE SOURCES FOR NANOELECTROSPRAY APPLICATIONS
S. Le Gac, S. Arscott and C. Rolando
UMR CNRS

ANALYSIS OF MOLECULAR BINDING TO HUMAN SERUM ALBUMIN USING A T-SENSOR
A. Hatch, E. Garcia and P. Yager
University of Washington

FIRST MEASUREMENT RESULTS WITH INTEGRATED PROJECTION CYTOMETER
J.H. Nieuwenhuis¹, J. Bastemeijer², P.M. Sarro² and M.J. Vellekoop¹
¹Vienna University of Technology and ²Delft University of Technology

A NOVEL HIGH-FREQUENCY SENSOR FOR BIOLOGICAL DISCRIMINATION
T.C. Messina¹, L.N. Dunkleberger¹, G.A. Mensing², A.S. Kalmbach³,
R. Weiss³, D.J. Beebe² and L.L. Sohn¹
¹University of California, Berkeley, ²University of Wisconsin and ³Princeton University

MICROSCALE IMPEDANCE-BASED DETECTION OF BACTERIAL METABOLISM
R. Gómez, D. Akin, A.K. Bhunia, M.R. Ladisch and R. Bashir
Purdue University

INTEGRATED MICROFLUIDIC GAS SENSORS FOR WATER MONITORING
L. Zhu¹, C. Kimball¹, N. Sniadecki¹, M. Beamesderfer², S. Semancik³,
and D.L. DeVoe¹
¹University of Maryland, ²NASA Goddard Space Flight Center and
³National Institute of Standards and Technology

TOWARDS A FULLY AUTOMATED PLANAR PATCH-CLAMP BASED
DOSE-RESPONSE MEASUREMENT SYSTEM
B. Matthews and J.W. Judy
University of California, Los Angeles

IMPEDANCE BASED SINGLE CELL DETECTION USING RESONANCE
FREQUENCY INTERROGATION
D. Holmes and H. Morgan
University of Glasgow

PASSIVE CALIBRATION-VAPOR SOURCE FOR A MICRO GAS CHROMATOGRAPH
M.C. Oborny^{1, 2}, J. Zheng^{1, 3}, J.M. Nichols¹, C.-J. Lu¹,
P.L. Bergstrom^{1, 3}, R.P. Manginell², G.C. Frye-Mason² and E.T. Zellers¹
¹University of Michigan, ²Sandia National Laboratories and
³Michigan Technological University

MONOLITHICALLY-INTEGRATED MICROCHEMLAB FOR GAS-PHASE CHEMICAL ANALYSIS
R.P. Manginell, M. Okandan, R.J. Kottenstette, P.R. Lewis, D.R. Adkins,
J.M. Bauer, R.G. Manley, S. Sokolowski and R.J. Shul
Sandia National Laboratories

DYE-FLUORESCENCE LED-SPEC: A BATTERY-OPERATED, ON-CHIP,
WAVELENGTH-TUNABLE OPTICAL SOURCE FOR DETECTION OF BIOCHEMICALS
L. Que, P. Selvaganapathy, B. Mitra, C.G. Wilson and Y.B. Gianchandani
University of Michigan

MICRO CONFOCAL LINE SCANNING SYSTEM FOR MULTIPLEXED BIOCHIPS

S. Kwon, G.L. Liu, K. Jeong and L.P. Lee
University of California, Berkeley

AN INTEGRATED OPTICAL DETECTOR FOR MICROFABRICATED ELECTRICAL FIELD FLOW FRACTIONATION SYSTEM

H.J. Sant and B.K. Gale
University of Utah

MICROSPECTROMETER USING OPTICAL DIVERSITY

W.-C. Shih, C. Hidrovo, S.-G. Kim and G. Barbastathis
Massachusetts Institute of Technology

PROTEIN MASS DETECTION SYSTEM IN LIQUID FOR PROSTATE-SPECIFIC ANTIGEN (PSA) USING PDMS LIQUID CELL BY RESONANT FREQUENCY SHIFT OF MICROMACHINED PZT CANTILEVER

T.S. Kim¹, K.S. Hwang², J.H. Lee¹, J.B. Park¹, J.H. Park²
¹*Korea Institute of Science and Technology* and ²*Korea University*

4:15 – 5:15 pm
Droplet Processing

SEPARATION, TRAPPING, AND ANALYSIS OF BIOLOGICAL NANO-PARTICLES IN BIOMEMS

M. Stelzle¹, M. Dürr¹, G. Grad³, P. Geggier², A. Haage⁴, R. Hagedorn⁵, M. Jäger², J. Kentsch¹, T. Müller⁵, A. Normann⁴ and T. Schnelle³

¹*Natural and Medical Sciences Institute*, ²*Fraunhofer Institute for Biomedical Engineering*, ³*Evotec Technologies GmbH*,

⁴*Mediagnost GmbH* and ⁵*Humboldt University, Berlin*

IN-PLANE DIGITAL SORTING OF FLOW-THROUGH DROPLET PHASE MICROFLUIDS

J.S. Go¹, E.H. Jeong², K.C. Kim³, S.Y. Yoon³ and S. Shoji¹

¹*Waseda University*, ²*Japan Science and Technology Corporation* and ³*Pusan National University*

4:15 – 5:15 pm
Applications

COMBINING DROPLET-BASED LIQUID HANDLING AND ON-CHIP

CAPILLARY ELECTROPHORESIS WITH A NEW SAMPLE INJECTION METHOD

S. Kaneda and T. Fujii
University of Tokyo

GENETIC ANALYSIS USING A PORTABLE PCR-CE MICROSYSTEM

E.T. Lagally, J.R. Scherer, R.G. Blazej and R.A. Mathies
University of California, Berkeley

CLINICAL DIAGNOSTICS ON HUMAN WHOLE BLOOD, PLASMA, SERUM, URINE, SALIVA, SWEAT, AND TEARS ON A DIGITAL MICROFLUIDIC PLATFORM

V. Srinivasan, V.K. Pamula, M.G. Pollack and R.B. Fair
Duke University

SMART DISPOSABLE PLASTIC LAB-ON-A-CHIP FOR POINT-OF-CARE-TESTING (POCT)

A. Puntambekar¹, C. Hong¹, C. Gao¹, X. Zhu¹, R. Trichur¹, J. Han¹, S. Lee¹, J. Kai¹, J. Do¹, R. Rong¹, S. Chilukuru¹, M. Dutta¹, L. Ramasamy¹, S. Murugesan¹, R. Cole¹, J. Nevin¹, G. Beauceage¹, J.B. Lee², J.Y. Lee³, M. Bissell³, J.W. Choi¹ and C.H. Ahn¹

¹*University of Cincinnati*, ²*University of Texas* and ³*Ohio State University*

6:00 – 9:30 pm

Banquet

Thursday, October 9, 2003

8:30 - 8:40 am

Widmer Poster Award Announcement

8:40 - 9:20 am
Plenary VI

FABRICATION OF A μ -SCALE HIGH THROUGHPUT PLATFORM FOR HIGH DENSITY GENE EXPRESSION AND GENOTYPING APPLICATIONS

Martin J. Goldberg, H. Dong, D. Nguyen, M. Shirazi, M. Yamamoto, Q. Yang and T. Yu
Affymetrix Inc.

9:25 - 10:25 am
Optics I

NOVEL SPECTROSCOPIC TOOL FOR MOLECULAR BEHAVIORS AT MICRO LIQUID INTERFACES

A. Hibara^{1, 2, 3}, M. Nonaka¹, S. Toyomura¹ and T. Kitamori^{1, 2, 3}

¹University of Tokyo, ²Kanagawa Academy of Science and Technology and ³Japan Science and Technology Corporation

3-D IMAGING OF MOVING DROPLETS FOR MICROFLUIDICS USING OPTICAL COHERENCE TOMOGRAPHY

V. Srinivasan, V. Pamula, K. Divakar Rao, M. Pollack, J.A. Izatt and R. Fair
Duke University

INTEGRATION OF MULTI-ASPHERICAL LENSES AND OPTICAL FIBERS ONTO A PDMS MICROFLUIDIC DEVICE FOR FLUORESCENCE-BASED DETECTION

K. Ono^{1, 2}, S. Kaneda², S. Camou² and T. Fujii²

¹Enplas Laboratories, Inc. and ²University of Tokyo

9:25 - 10:25 am
DNA I

FAST SEPARATION OF LONG DNA IN A MICROCHIP

N. Minc, C. Fütterer, C. Gosse, K.D. Dorfmann and J.-L. Viovy
Institut Curie

FAST SEPARATION OF LARGE DNA BY NANOPILLAR CHIP

N. Kaji¹, Y. Takamura², Y. Horiike², H. Nakanishi³, T. Nishimoto³ and Y. Baba^{1, 4}

¹University of Tokushima, ²University of Tokyo, ³Shimadzu Corporation and ⁴National Institute of Advanced Industrial Science and Technology

SELF-CONTAINED, INTEGRATED BIOCHIP SYSTEM FOR SAMPLE-TO-ANSWER GENETIC ASSAYS

R.H. Liu¹, J. Yang¹, R. Lenigk¹, J. Bonanno¹, P. Grodzinski² and F. Zenhausern¹

¹Arizona State University and ²Los Alamos National Laboratory

10:30-11:00 am

Break

11:00 am-12:00 pm
Optics II

TOTAL INTERNAL REFLECTION-BASED BIOCHIP FOR HIGH THROUGHPUT BIOASSAYS

N. Chronis and L.P. Lee
University of California, Berkeley

IMPROVED MICROFLUIDIC DESIGN OF AN ON-CHIP TUNABLE DYE LASER

B. Bilenberg, J.P. Kutter and A. Kristensen
Technical University of Denmark

SU-8 BASED SOLID STATE DYE LASERS FOR LAB-ON-A-CHIP MICROSYSTEMS

S. Kragh, S. Balslev and A. Kristensen
Technical University of Denmark

THURSDAY CONTINUED

11:00 am-12:00 pm
DNA II

SINGLE MOLECULE AMPLIFICATION IN A CONTINUOUS FLOW LABCHIP DEVICE

J. Baker, M. Strachan, K. Swartz, Y. Yurkovetsky, A. Rulison, C. Brooks, A. Kopf-Sill
Caliper Technologies Corp.

*STUDY OF ELECTROCHEMICAL DETECTIONS OF A SINGLE DNA MOLECULE COUPLED WITH
FLUORESCENCE QUENCHING IN MICRO- AND NANOFABRICATED DEVICES*

M. Ueda
University of Tokushima

SELECTIVE DNA SENSING ELEMENTS INTEGRATED INTO MICROFLUIDIC CHANNELS

R.A. Zangmeister and M.J. Tarlov
National Institute of Standards and Technology

12:00 Noon

Conference adjourns