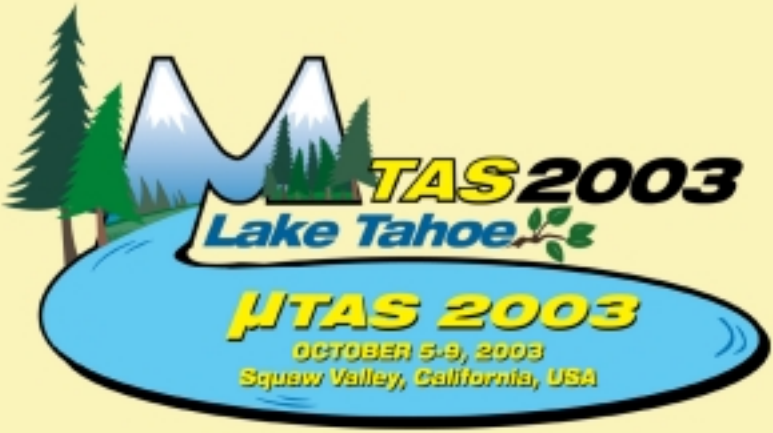

SEVENTH INTERNATIONAL CONFERENCE
ON MINIATURIZED CHEMICAL AND
BIOCHEMICAL ANALYSIS SYSTEMS

October 5-9, 2003

Squaw Valley, California USA

ADVANCE PROGRAM

Sponsored by

The Transducer
Research Foundation

IEEE Electron Devices Society

www.microTAS2003.org

PROGRAM AT A GLANCE

SUNDAY	2:00 pm - 6:00 pm	Registration	
	4:30 pm - 6:00 pm	Welcome Reception	
MONDAY	8:15 am - 8:30 pm	Opening Remarks	
	8:30 am - 9:10 am	PLENARY 1	
	9:15 am - 10:15 am	NanoFluidics I	Cells I
	10:15 am - 10:45 am	Break	
	10:45 am - 11:45 am	NanoFluidics II	Cells II
	11:45 am - 1:30 pm	Lunch Break	
	1:30 pm - 2:10 pm	PLENARY 2	
	2:15 pm - 5:00 pm	Poster Session	
	5:00 pm - 6:00 pm	Separations I	Materials
TUESDAY	8:00 am - 9:10 am	PLENARY 3	
	9:15 am - 10:15 am	Two-Phase MicroFluidics I	Proteomics I
	10:15 am - 10:45 am	Break	
	10:45 am - 11:45 am	Two-Phase MicroFluidics II	Proteomics II
	11:45 am - 1:30 pm	Lunch Break	
	1:30 pm - 2:10 pm	PLENARY 4	
	2:15 pm - 5:00 pm	Poster Session	
	5:00 pm - 6:00 pm	Separations II	Fabrication
WEDNESDAY	8:00 am - 9:10 am	PLENARY 5	
	9:15 am - 10:15 am	Fluidics I	Proteomics III
	10:15 am - 10:45 am	Break	
	10:45 am - 11:45 am	Fluidics II	Cells III
	11:50 am - 1:30 pm	Lunch Break	
	1:30 pm - 4:15 pm	Poster Session	
	4:15 pm - 5:15 pm	Droplet Processing	Applications
	6:00 pm - 9:30 pm	Banquet	
THURSDAY	8:30 am - 8:40 am	Widmer Poster Award Announcement	
	8:40 am - 9:20 am	PLENARY 6	
	9:25 am - 10:25 am	Optics I	DNA I
	10:30 am - 11:00 am	Break	
	11:00 am - 12:00 pm	Optics II	DNA II
	12:00 noon	Conference Adjourns	

INVITATION TO ATTEND

On behalf of the µTAS Program and Steering Committee, I would like to extend the warmest of greetings and invitation to you. Set in this beautiful alpine environment, we will bring to you the most stimulating and provocative conference on microsystem technologies of the year. From over 500 abstract submissions, we selected a program of 333 papers. There are 66 oral and 261 poster presentations, and 6 invited speakers. These represent a very broad range of institutions from over 20 countries. In keeping with the tradition of µTAS, we applied very strict standards to the selection process requiring significant application data and results from state-of-the art science and technology. We identified papers that represented new up-to-date research and development activities, so that the participants would experience the highest level of advancements in the field. We chose the beautiful Lake Tahoe area for the conference to provide a unique experience for the individuals and families that attend. Being one of the highest, deepest, and clearest lakes in the world, we feel that it represents the same goals and standards that the µTAS conference is trying to achieve.

The superb quality of the facilities of Squaw Valley, recreational options of the Sierra Nevada, and the beauty of Lake Tahoe will provide you with an ideal environment to listen, learn, participate, and interact with your fellow scientists and engineers. We believe that fruitful discussions and collaborations will result – ensuring the continued success of µTAS and its mission. µTAS may not be the largest conference, but we have strived to make it exceptionally strong on a technical basis. From the 3,000 meter mountains, the 500 meter depth of Lake Tahoe, to the nanometer-sized features of the devices presented - *we believe you will enjoy the depth, breadth, and high quality of the conference!*

Thank you!

M. Allen Northrup Ph.D.
Chairman, µTAS 2003

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TECHNICAL PROGRAM INFORMATION

The technical program consists of six plenary sessions, two parallel oral sessions of contributed papers, and three poster sessions. The plenary sessions will be held on each day. There will be two parallel oral sessions each day. Three poster sessions will be held in the tent in the Pavilion, from 2:15 p.m. to 5:00 p.m. on Monday and Tuesday and from 1:30 pm - 4:15 pm on Wednesday. Authors will be available for questions during these times. Posters will be on display from Monday at 10:15 a.m. through Wednesday at 5:15 p.m. All poster papers are listed in this program on their day that they are on display.

Plenary Speakers

Daniel Branton ..... *Harvard University*
Christopher S. Chen ..... *Johns Hopkins University*
Martin J. Goldberg ..... *Affymetrix Inc.*
Stephen Quake ..... *California Institute of Technology*
Brian R. Warrington ..... *GlaxoSmithKine R&D*
Masao Washizu ..... *University of Tokyo*

CONFERENCE OFFICIALS

CONFERENCE CHAIR

M. Allen Northrup ..... *MicroFluidic Systems Inc.*

STEERING AND PROGRAM COMMITTEE

Yoshinobu Baba ..... *University of Tokushima*
David Beebe ..... *University of Wisconsin*
Albert van den Berg ..... *University of Twente*
D. Jed Harrison ..... *University of Alberta*
Klavs F. Jensen ..... *Massachusetts Institute of Technology*
Takehiko Kitamori ..... *University of Tokyo*
Thomas Laurell ..... *Lund University*
M. Allen Northrup ..... *MicroFluidic Systems Inc.*
J. Michael Ramsey ..... *Oak Ridge National Laboratory*
Shuichi Shoji ..... *Waseda University*
Sabeth Verpoorte ..... *University of Neuchâtel*
Jean-Louis Viovy ..... *Curie Institute*

TRF LIAISON

Antonio Ricco ..... *NASA Ames Research Center & Stanford University*

LOCAL COMMITTEE

Andrea Chow ..... *Caliper Technologies*

GENERAL INFORMATION

Conference Website
www.microtas2003.org

Conference Location
All sessions will be held at the Resort at Squaw Creek.

The Resort at Squaw Creek
400 Squaw Creek Road
Olympic Valley, California USA
Phone:1-800-403-4434 (Domestic)
Phone:+1-617-236-5800 (International)
Fax: +1-530-581-6632
Web site: http://www.squawcreek.com/

Lake Tahoe's spectacular north shore, offers a pristine scenery and unparalleled charm that continues to inspire all who enter this area. Nestled in the Sierra Nevada, the north shore is a diverse and unspoiled meeting destination easily accessible by air or car. On California's eastern (98 miles northeast of Sacramento / 200 miles northeast of San Francisco) and Nevada's western stateline (45 miles southwest of Reno) are major highways that serve the Tahoe area. The Reno-Tahoe International Airport is located 45 minutes from The Resort at Squaw Creek. The Resort at Squaw Creek is located in the heart of Squaw Valley (home of the 1960 Winter Olympics) on 626 acres, and is 6 miles from Lake Tahoe itself.

Passport and Visa
All foreign visitors desiring to enter the United States must have a valid passport. Participants from countries requiring visas should apply to the American Consular offices or diplomatic mission in their countries. For details, please consult your travel agent or the nearest American consulate. Conference Management can send you a letter of invitation to the conference. Send a request by email to info@microtas03.org. No funds are available to assist with travel and registration fees cannot be waived.

Climate
The weather in Squaw Valley in October is pleasant with the following temperatures:

Normal High:	80˚ / 28˚C
Normal Low:	58˚ / 14˚C

Official Language
The official language of the conference is English and will be used for all presentations and printed materials.

Insurance
The organizer cannot accept liability for accidents, injuries and losses which might occur. Participants are encouraged to obtain travel insurance (medical, personal accident, and luggage) in their home country prior to departure.

Currency Exchange
Only US dollars are acceptable at regular stores and restaurants. The exchange rate fluctuates daily. *Visit http://europe.onada.com*

Traveller's Checks and Credit Cards
Credit cards, including MasterCard®, Diners Club®, Visa® and American Express®, and traveller's checks are accepted at most hotels, restaurants, department stores, and souvenir shops.

Electricity
Electricity throughout the United States is 110V, 60 Hz.

Conference Management
All questions and requests should be directed to:

Preferred Meeting Management, Inc.
2320 6th Avenue
San Diego, CA 92101-1643
Phone: 1-619-232-9499
Fax: 1-619-232-0799
E-mail: info@microtas2003.org

REGISTRATION INFORMATION

The conference begins with registration at the Resort at Squaw Creek on Sunday, October 5th from 2:00 p.m. - 6:00 p.m. An informal Wine and Cheese Welcome Reception will be held in conjunction with registration from 4:30 p.m. - 6:00 p.m. The official technical program will begin Monday morning at 8:15 a.m. and adjourns on Thursday, October 9th, at approximately 12:00 p.m.

Registration Fees

Registration Fee	Early Bird Before 8/15/03	Advanced After 9/19/03	On-Site After 9/19/03
Standard	$760.00	$835.00	$960.00
Student w/o meals	$435.00	$475.00	$510.00
Student	$585.00	$635.00	$695.00
Daily	$400.00	$475.00	$510.00

Registration & Information Desk

The Registration and Information desk will be open during the following times:

Sunday, October 5th . . . . . 2:00 p.m. - 6:00 p.m.
Monday, October 6th . . . . . 7:00 a.m. - 6:00 p.m.
Tuesday, October 7th . . . . . 8:00 a.m. - 6:00 p.m.
Wednesday, October 8th . . . . . 8:00 a.m. - 6:00 p.m.
Thursday, October 9th . . . . . 8:00 a.m. - 12:00 p.m.

Registration is an electronic process. To register for the conference please visit the website (*www.microtas2003.org*). All attendees are encouraged to register in advance to avoid delays in registering at the conference. If you are unable to register online, a registration form is provided for you in the back of this brochure.

Registration payment, in U.S. Dollars only, is due upon submission of registration. The registration fee includes program material, (1) Technical Digest and CD ROM, exhibit hall access, welcome reception, refreshment breaks, 3 lunches and a 20% non-refundable cancellation fee. A $50.00 fee will be charged for all substitutions. A $5 fee will be assessed for lost or duplicate nametags.

Cancellation Policy

A 20% non-refundable cancellation fee will be assessed to all cancellations on or before September 12, 2003. No refunds will be made after that date. Cancellation notice and refunds must be requested in writing.

TRAVEL INFORMATION

Airlines

The Conference has selected ***American Airlines*** as the official airline.
To begin your meeting successfully with American Airlines, follow these simple steps:

1. Call American Airline Reservations at 1-800-433-1790.
2. Refer to File Number: 60H3AK

Additional Airlines

These airlines also serve the Reno/Tahoe Airport.

Alaska Airlines	1-800-426-0333	www.alaska-air.com
America West Airlines	1-800-327-7810	www.aa.com
Continental Airlines	1-800-295-4983	www.continental.com
Delta Air Lines	1-800-221-1212, 1-617-561-2745	www.delta.com
Frontier Airlines	1800-432-1359	www.flyfrontier.com
Northwest Airline	1-800-225-2525	www.nwa.com
Southwest Airlines	1-800-435-9792, 1-401-739-0563	www.southwest.com
United Airlines	1-800-241-6522	www.ual.com

Car Rental

The Conference has selected ***Hertz*** as the official car rental company.
To begin your meeting successfully with Hertz, follow these simple steps:

1. Call
   1-800-654-2240 in the U.S.;
   1-800-263-0600 in Canada;
   1-416-620-9620 in Toronto;
   or outside these areas at 1-405-749-4434
2. Refer to CV#: 022R0794

Meeting rates are guaranteed from one week prior through one week after the meeting dates and are subject to availability. Advance reservations are recommended; blackout dates may apply. Government surcharges, taxes, tax reimbursement, airport related fees, vehicle licensing fees and optional items, such as refueling or additional driver fees, are extra. Minimum rental age is 25 (exceptions apply). Standard rental conditions and qualifications apply. In the continental U.S., weekend rentals are available for pick-up between noon Thursday and noon Sunday and must be returned no later than Monday at 11:59 p.m. Weekend rentals have a minimum two-day keep and Thursday pick-up requires a minimum three-day keep. Weekly rentals are from five to seven days. Extra day rate for Weekly rentals will be charged at 1/4 of the Weekly Rate.

Airport Shuttle Transportation

Squaw Creek Transportation reservations system is designed to make arranging your transportation as simple and efficient as possible. You can call their reservation agents between 7am and 7 pm PST, 7 days a week at 1-866-909-7433. Please have the following information available before you call:

- Name(s)
- Registered Name at hotel
- Phone Number
- Arrival Date
- Group Size
- Airline and Flight Number
- Flight Arrival Time
- Pick Up Location and Destination – on the hour service by request
- Departure Location and Destination

Private transportation service available on request ($98 for 1-3 passengers - one way, $15 for each additional passenger).

Transfer to/from the Reno/Tahoe International Airport (4 am - 11 pm): $38.00 - per person each way

To ensure that you receive this special group rate, please identify yourself as an attendee of the MicroTAS conference. For more information please visit their website at:
http://www.squawcreektransportation.com/site/transfer.htm or contact them directly at 1-866-909-7433.

We gratefully acknowledge, at the time of printing this brochure, the financial contributions to the conference from the following:

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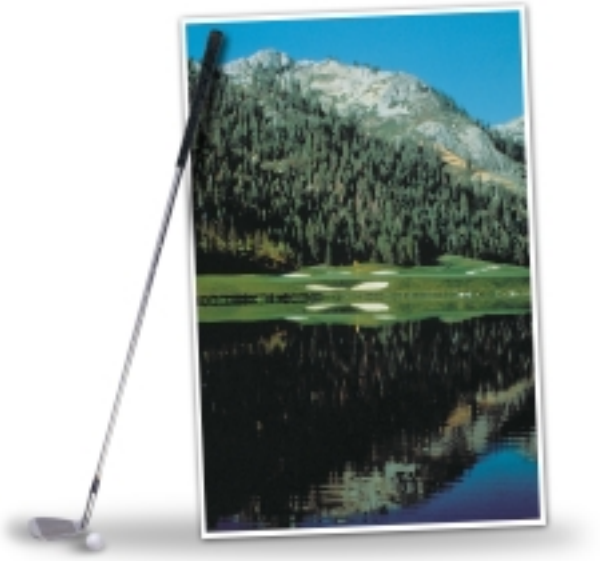
The Seventh International Conference on Miniaturized Chemical and Biochemical Analysis Systems provides an easy and affordable path to reach an audience of 600+ research scientists and professionals in miniaturized chemical and biochemical analysis systems technology from organizations around the world.

The MicroTAS 2003 Conference exhibit area will provide your company or organization with the opportunity to inform and display your latest products, services, equipment, books, journals and publications to the 600+ professionals from around the world.

As a Contributor of MicroTAS 2003 it will provide your company with visibility and exclusive opportunities to connect with the attendees with a specific and targeted means of getting your name in front of this audience.

Please see the web-site (***www.microtas2003.org***) for further information on contributing or exhibiting at this conference.



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-NANOFLUIDIC 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 NANOCHANNELS* J.P. Alarie[1], A.B. Hmelo[2], S.C. Jacobson[1], A.P. Baddorf[1], L. Feldmen[2] and J.M. Ramsey[1] [1]*Oak Ridge National Laboratory* and [2]*Vanderbilt University* *WATER PLUGS IN NANOCHANNELS UNDER NEGATIVE PRESSURE* N.R. Tas[1], P. Mela[1], T. Kramer[2], J.W. Berenschot[1] and A. van den Berg[1] [1]*University of Twente* and [2]*EPFL*
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. Arai[1], H. Maruyama[1], T. Fukuda[1] and T. Katsuragi[2] [1]*Nagoya University and* [2]*Nara Institute of Science and Technology* *NANOHOLE 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 NANOCHANNELS 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. Lee[1], L.-M. Fu[2], R.-J. Yang[1] and Y.-J. Pan[1]
[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. Timmer[1], K.M. van Delft[1], R.P. Otjes[2], W. Olthuis[1],
P. Bergveld[1] and A. van den Berg[1]
[1]*University of Twente* and [2]*Energy Research Centre of the Netherlands*

INTRINSIC AUTOFLUORESCENCE OF SINGLE LIVING CELLS FOR LABEL-FREE CELL SORTING IN A MICROFLUIDIC SYSTEM
J. Emmelkamp[1], R. DaCosta[2], H. Andersson[1, 3] and A. van den Berg[1]
[1]*University of Twente,* [2]*University of Toronto* and [3]*Royal 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. Koster[1], A. Blau[2], C. Ziegler[2], J.-C. Roulet[1], N.F. de Rooij[1] and E. Verpoorte[1]
[1]University of Neuchâtel and [2]University 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. Sando[1], K. Higashino[1], Y. Fujii[1], T. Fukuba[2], S. Usui[2] and T. Fujii[2]
[1]*Minolta Co. Ltd.* and [2]*University of Tokyo*

DEVELOPMENT OF ELECTROOSMOTIC 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. Jeon[1], J.-H. Kim[2], J. Noh[1], S.I. Woo[1], E. Yoon[1] and H.G. Park[1]
[1]*Korea Advanced Institute of Science and Technology* and
[2]*Samsung Advanced Institute of Technology*

DYNAMICS OF SHEAR-INDUCED DROP FORMATION IN T-SHAPED MICROCHANNELS
J. Husny[1], H. Jin[2], E. Harvey[2] and J. Cooper-White[1]
[1]*University of Melbourne* and [2]*Swinburne 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. Nijdam[1], A.H. Monica[1], A.P. Gadre[1], J.A. Garra[1], T.J. Long[1,2], C. Luo[1], M.-C. Cheng[1], T.W. Scheider[1,2], R.C. White[1,2], M. Paranjape[1] and J.F. Currie[1]
[1]*Georgetown University* and [2]*SAIC*

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 µCHEMLAB
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. Anraku[1], A. Hattori[1], T. Asai[1], T. Fukuzawa[1], M. Tokeshi[2] and T. Kitamori[3]
[1]*Nippon Sheet Glass,* [2]*Kanagawa Academy of Science and Technology* and [3]*University 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

MEMS 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

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. Cheng[1], A.J. Nijdam[1], J.A. Garra[1], A.P. Gadre[1], T.W. Scheneider[2], R.C. White[2], M. Paranjape[1] and J.F. Currie[1]
[1]*Georgetown University* and [2]*Science Applications International Corporation*

ELECTROACTIVE POLYMERS FOR MICROACTUATORS AND MICROFLUIDIC DEVICES
F. Xia[1], T.-B. Xu[2], S. Tadigadapa[1] and Q.M. Zhang[1]
[1]*Penn State University* and [2]*NASA/LaRC*

MULTI-POLYMER FABRICATION OF A BIO-FLUIDIC TRANSDERMAL SAMPLING DEVICE
A.P. Gadre[1], Y.N. Srivastava[1], J.A. Garra[1], A.J. Nijdam[1], A.H. Monica[1], M.C. Cheng[1], C. Luo[1], T.W. Schneider[1, 2], T.J. Long[2], R.C. White[1, 2], T. Hylton[1], M. Paranjape[1] and J.F. Currie[1]
[1]*Georgetown University* and [2]*Science Application International Corporation*

THREE-DIMENSIONAL MICRO CAPILLARIES FORMED BY GRAY-SCALE LITHOGRAPHY OF PHOTOSENSITIVE 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. Momose[1], T. Fukasawa[2], H. Takasu[1] and Y. Horiike[3]
[1]*Rohm Co., Ltd.*, [2]*University of Tokyo* and [3]*National Institute of Materials Science*

10-WAY MICRO SWITCHING VALVE CHIP FOR MULTI-DIRECTIONAL FLOW CONTROL
T. Hasegawa[1], K. Ikuta[2] and K. Nakashima[1]
[1]*Osaka Institute of Technology* and [2]*Nagoya University*

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

ELECTROOSMOTIC 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. Viovy[2] and J. Bibette[1]
[1]*ESPCI* and [2]*Institut 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. Dang[1], L.H. Zhang[2], M. Ishigawa[1] and Y. Baba[1, 2]
[1]AIST and [2]University of Tokushima

POLYMER SYNTHESIZER BASED ON MAGNETIC TRANSPORT OF PARTICLES
M. Ikeuchi[1] and M. Washizu[2]
[1]Nagoya University and [2]University of Tokyo

MULTIPLEX PCR ON MULTICHANNEL MICROCHIP ELECTROPHORESIS, AN ULTRAFAST TECHNOLOGY FOR GENETIC DIAGNOSIS
M. Jabasini[1], F. Xu[1], Y. Nakahori[1] and Y. Baba[1,2]
[1]*University of Tokushima* and [2]*Shimadzu Corp.*

FAST SCREENING REDUCED-VISCOSITY MIXED POLYMER SOLUTIONS USING AN ORTHOGONAL DESIGNING APPROACH FOR MICROCHIP SEPARATION OF SPECIFIC DNA
F. Xu[1, 2], M. Jabasini[1] and Y. Baba[1, 3]
[1]*University of Tokushima*, [2]*Shimadzu Corp.* and [3]*National 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. Fortt[1], A. Iles[2] and A.J. de Mello[2]
[1]*Central Research Laboratories Ltd.* and [2]*Imperial 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. Schlüter[1], S. Mammitzsch[2], M. Martens[2], S. Gasso[2] and H.-J. Lilienhof[1]
[1]*University of Applied Sciences* and [2]*Future 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. Abe[1], Y. Fujiyama[1], T. Sakamoto[2], A. Mahara[2], A. Yamayoshi[2], H. Nakanishi[1], S. Shoji[3] and A. Murakami[2]
[1]*Shimadzu Corporation*, [2]*Kyoto Institute of Technology* and [3]*Waseda University*

SNP ANALYSIS BY DYNAMIC ALLELE SPECIFIC HYBRIDIZATION ON PATTERNED MONOLAYERS OF BEADS
A. Russom[1], G. Axehult[1], T. Mayr[2], P. Melvås[1], A.J. Brookes[2], H. Andersson[1] and G. Stemme[1]
[1]Royal Institute of Technology and [2]Karolinska Institute

DEVELOPMENT OF IN SITU FLOW-THROUGH ANALYZER OF Mn^{2+} 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. Guo[1], C.-J. Huang[1, 3] and J. Cheng[1, 2]
[1]*National Engineering Research Center for Beijing Biochip Technology*, [2]*Tsinghua University* and [3]*Huazhong University of Science and Technology*

MICRO-FLOW-SYSTEMS WITH BIOSENSOR DETECTION FOR IN-VIVO USE
I. Moser[1], G. Jobst[1], P.S. Petrou[2] and G.A. Urban[1]
[1]*IMTEK* and [2]*Immunoassay Laboratories*

DYNAMIC LABELING OF NON-DENATURED AND HEAT-DENATURED PROTEINS FOR LASER-INDUCED FLUORESCENCE (LIF) DETECTION ON MICROCHIPS
B.C. Giordano[1], D. Burgi[2], S. Kouresh[1], J.P. Ferrance[1] and J.P. Landers[1]
[1]*University of Virginia* and [2]*dbqp*

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. Carlier[1], S. Le Gac[2], S. Arscott[1], V. Thomy[1], J.C. Fourrier[1], F. Caron[1], C. Cren-Olivé[2], C. Rolando[2], J.C. Camart[1], C. Druon[1] and P. Tabourier[1]
[1]*Institut d'Electonique de Microélectronique et de Nanotechnologie* and [2]*Université 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. Moriguchi[1], S. Ishiwata[3] and K. Yasuda[1]
[1]*University of Tokyo*, [2]*Sigma Koki, Co. Ltd.* and [3]*Waseda 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. Fukui[1], M. Yamada[1], N.Y. Lee[1] and M. Seki[1, 2]
[1]*University of Tokyo* and [2]*Osaka 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. Hattori[1], H. Yamaguchi[1], J. Yamaguchi[1], Y. Matsuoka[1], S. Kanki[1], T. Fukuzawa[1], T. Miwa[1], M. Toyama[1], M. Tokeshi[2] and T. Kitamori[3]
[1]*Nippon Sheet Glass Co., Ltd.*, [2]*Kanagawa Academy of Science and Technology* and [3]*University of Tokyo*

LASER BACKGROUND REJECTION OPTIMIZATION IN INTEGRATED OPTOELECTRONIC FLUORESCENCE SENSORS
E. Thrush[1], O. Levi[1], W. Ha[2], G. Carey[1], L.J. Cook[1], J. Diech[1], S.J. Smith[1], W.E. Moerner[1] and J.S. Harris Jr.[1]
[1]*Stanford University* and [2]*Novalux 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]
[1]*University of Tokushima*, [2]*Japan Science and Technology Corporation* and [3]*National Institute of Advanced Industrial Science and Technology*

INTEGRATED ELECTROCHEMICAL DNA SENSORS WITH MICROFLUIDIC CHANNEL REACTOR
C. Oda[1], K. Sawada[1], T. Tsuchiya[2], H. Takao[1] and M. Ishida[1]
[1]Toyohashi University of Technology and [2]Fuji Photo Film Co., Ltd.

FABRICATION OF OPEN PDMS ELECTROSPRAY TIPS INTEGRATED WITH MICROCHANNELS USING REPLICATION FROM A NICKEL MASTER
M. Svedberg[1], M. Veszelei[2], J. Axelsson[2], M. Vangbo[2] and F. Nikolajeff[1]
[1]*Uppsala University* and [2]*Amersham 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. Kitamura[2], Y. Arakawa[2] and T. Fujii[2]
[1]*CNRS-IIS* and [2]*University of Tokyo*

ENHANCEMENT OF SIGNAL-TO-NOISE LEVELS BY SYNCHRONIZED DUAL WAVELENGTH MODULATION FOR LIGHT EMITTING DIODE (LED) FLUORIMETRY IN MICROFLUIDIC SYSTEMS
T. Zhang[1], Q. Fang[2], S.-L. Wang[1] and Z.-L. Fang[2]
[1]*Northeastern University* and [2]*Zhejiang 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. Hayashi[1], Y. Iwasaki[1], R. Kurita[2], T. Horiuchi[1], K. Sunagawa[3] and O. Niwa[1]
[1] *NTT Microsystem Integration Labloratories*, [2]*NTT Advanced Technology Corporation* and [3]*National Cardiovascular Center*

BIOSENSOR BASED ON SU-8 CANTILEVER BY USING ELECTROSPRAY DEPOSITION OF PROTEINS
J. W. Kim[1, 2], Y. Yamagata[1], B.J. Kim[2], S. Takeuchi[2] and T. Higuchi[2]
[1]*Riken* and [2]*University of Tokyo*

DISPOSABLE HEALTHCARE CHIP ALLOWING MULTI-ITEM DIAGNOSTICS IN A TRACE OF BLOOD
M. Takai[1], S. Shinbashi[2], H. Ogawa[2], A. Oki[3], M. Nagai[2] and Y. Horiike[3]
[1]*University of Tokyo,* [2]*Japan Science and Technology Corporation* and [3]*National Institute of Materials Science*

5:00 - 6:00 pm
Separations I

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. Horiike[1], S.H. Lee[2], T. Nishimoto[1] and C.H. Ahn[2]
[1]*Shimadzu Corporation* and [2]*University 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. Chan[1], A.P. Alivisatos[1, 2] and R.A. Mathies[1]
[1]*University of California, Berkeley* and [2]*Lawrence Berkeley National Laboratory*

PDMS MICROFLUIDIC DEVICES WITH PTFE PASSIVATED CHANNELS
M. Kanai[1, 2], D. Uchida[2], S. Sugiura[2], Y. Shirasaki[2], J.S. Go[2], H. Nakanishi[1], T. Funatsu[2] and S. Shoji[2],
[1]*Shimadzu Corporation* and [2]*Waseda University*

6:00 pm

Adjourn for the day

Tuesday, October 7, 2003

8:30 - 9:10 am
Plenary III

MICROENGINEEERED 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. Aota[1], M. Nonaka[1], A. Hibara[1] and T. Kitamori[1, 2]
[1]*University of Tokyo* and [2]*Kanagawa 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. Yamada[1], C. Sasaki[2], T. Isomura[3] and M. Seki[1, 4]
[1]*University of Tokyo*, [2]*Mitsubishi Chemical Group Science and Technology Research Center, Inc.*, [3]*Zoegene Corporation* and [4]*Osaka 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. Tkaczyk[1], D. Huh[1], J.H. Bahng[1], Y. Chang[2], H.-H. Wei[1], K. Kurabayashi[1], J.B. Grotberg[1], C.-J. Kim[2] and S. Takayama[1]
[1]*University of Michigan* and [2]*University 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. Vilkner and A. Manz
Imperial College London

10:45-11:45 am
Proteomics II

PROTEIN CRYSTALLIZATION DEVICE USING ELECTROSTATIC MICROMANIPULATION
M. Hirano[1], T. Torii[1], T. Higuchi[1], M. Kobayashi[2] and H. Yamazaki[3]
[1]*University of Tokyo,* [2]*Riken Harima Institute* and [3]*Techno 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. Takahashi[1], T. Ikuta[1], K. Nagayama[1], Y. Takaka[1] and T. Asano[2]
[1]*Kyushu University* and [2]*Kyushu 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 COMMERCIALLY AVAILABLE VALVES
P. Henriksson[1], H. Blom[1], M. Gösch[1], A.-S. Hedman[2], G. Arvidsson[2], C. Vieider[2] and R. Rigler[1]
[1]*Karolinska Institute* and [2]*ACREO 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. Denoual[1], K. Aoki[2], A. Mita-Tixier[1] and H. Fujita[1]
[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. Debusschere[1], H. Najm[1], A. Matta[2], O. Knio[2], R. Ghanem[2] and O. Le Maître[3]
[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. Xie[1] and Y.-C. Tai[1]
[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.Halle[1], J.J. Li[1], M.S. Munson[1], J. Monteith[2], E. Guzman[2],
S. Feather[2], J. Verba[2], Q. Porter[2], V. Kenning[2], A.E. Kamholz[2],
B.H. Weigl[3], P. Saltsman[3], R. Bardell[3] and P. Yager[1]
[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. Endo[1], A. Okuyama[2], Y. Matsubara[1], M. Kobayashi[1], Y. Morita[1], H. Mizukami[2] and E. Tamiya[1]
[1]*Japan Advanced Institute of Science and Technology* and
[2]*EnBioTec 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. Ducrée, 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

TUESDAY CONTINUED

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. Pollack[1], P.Y. Paik[1], A.D. Shenderov[2], V.K. Pamula[1], F.S. Dietrich[1] and R.B. Fair[1]
[1]*Duke University and* [2]*Nanolytics 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. Zhu[1], J. Zeng[2], M.S. Triantafyllou[1] and D.K.P. Yue[1]
[1]*Massachusettes Institute of Technology* and [2]*Coventor 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. Tamaki[1], Y. Morita[1], A. Hibara[1], H.B. Kim[1], M. Tokeshi[2], T. Ooi[1],
M. Nakao[1] and T. Kitamori[1, 2, 3]
[1]*University of Tokyo,* [2]*Kanagawa Academy of Science and Technology* and
[3]*Japan 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. Helmerson 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. Flachsbart, 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. Cheng[1], L.J. Guo[1] and C.-F. Chou[2]
[1]*University of Michigan* and [2]*Arizona State University*

Applications

PATTERNING RETINAL CELLS ON POLYELECTROLYTE MULTILAYERS
D.R. Reyes[1], E. Perruccio[2], S.P. Becerra[2], L.E. Locascio[1] and M. Gaitan[1]
[1]*National Institute of Standards and Technology* and [2]*National Institutes of Health*

POLYMER-BASED MODULAR MICROSYSTEMS FOR DNA SEQUENCING
S.A. Soper[1], W. Stryjewski[1], L. Zhu[1], Y. Xu[1], M. Wabuyele[1],
H. Chen[2], M. Galloway[1] and R.L. McCarley[1]
[1]*Louisiana State University* and [2]*Zhejiang University*

PURIFICATION OF HUMAN GENOMIC DNA FROM A SINGLE HAIR ROOT ON A MICRODEVICE AND DIRECT AMPLIFICATION OF ITS D1S80 LOCUS
N.Y. Lee[1], M. Yamada[1] and M. Seki[2]
[1]*University of Tokyo* and [2]*Osaka Prefecture University*

MICROFABRICATED FLOW-THROUGH PCR DEVICE FOR IN SITU GENE ANALYSIS IN EXTREME ENVIRONMENTS
T. Fukuba[1], T. Naganuma[2] and T. Fujii[1]
[1]*University of Tokyo* and [2]*Hiroshima University*

MICROCHIPS FOR CELL-TYPE IDENTIFICATION
Y.-C. Lin[1], M. Li[1], C.-Y. Wu[1], W.-C. Hsiao[1] and Y.-C. Chung[2]
[1]*National Cheng Kung University* and [2]*Industrial Technology Research Institute*

TWO-DIMENSIONAL GRADIENT GENERATION USING MICROFLUIDIC CHAMBER ARRAY
M. Yamada[1], M. Nakashima[1], N.Y. Lee[1] and M. Seki[2]
[1]*University of Tokyo* and [2]*Osaka 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. Ogawa[1], M. Nagai[1], J. Kikuchi[2] and Y. Horiike[3]
[1]*Japan Science and Technology Corp.*, [2]*Axiomatec Inc.* and
[3]*National 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. Tamanaha[1], S.P. Mulvaney[1], K.A. Wahowski[2], M.C. Tondra[3],
L.J. Whitman[1] and R.J. Colton[1]
[1]*Naval Research Laboratory*, [2]*Nova Research, Inc.* and [3]*NVE Corporation*

CONTINUOUS CULTURE AND MONITORING OF SELECTED AND ISOLATED MICROORGANISMS ON A CHIP USING THERMAL GELATION
F. Arai[1, 2], A. Ichikawa[1], T. Fukuda[1] and T. Katsuragi[3]
[1]*Nagoya University*, [2]*PRESTO, JST* and [3]*Nara Institute of Science and Technology*

IN-VIVO MEASUREMENT OF pH IN DIGESTIVE SYSTEM THROUGH WIRELESS COMMUNICATION
A. Oki[1], T. Yamada[2], H. Nakase[3], H. Uesugi[2], K. Tsubouchi[3], K. Masu[2] and Y. Horiike[1]
[1]*National Institute for Materials Science*, [2]*Tokyo Institute of Technology* and [3]*Tohoku 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. Koide[1], G. Takei[1], T. Kitamori[1, 2] and H.-B. Kim[1]
[1]*University of Tokyo* and [2]*Kanagawa 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]
[1]*University of Tokyo*, [2]*Japan Science and Technology Corp.*, [3]*Kanagawa Academy of Science and Technology* and [4]*Tokyo Women's Medical University*

MULTICHANNEL MICRO ELISA SYSTEM
K. Sato[1,2,3], M. Yamanaka[1], M. Tokeshi[2], K. Morishima[2] and T. Kitamori[1, 2, 3]
[1]*University of Tokyo*, [2]*Kanagawa Academy of Science and Technology* and [3]*Japan Science and Technology Corporation*

DEVELOPMENT OF MICROCHIP-BASED BIOASSAY SYSTEM USING CULTURED CELLS
M. Goto[1], K. Sato[1,2,3], M. Tokeshi[2] and T. Kitamori[1,2,3]
[1]*University of Tokyo*, [2]*Kanagawa Academy of Science and Technology* and [3]*Japan 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. Zhang[1], S. Zappe[1], R.W. Bernstein[2], C.-C. Chen[1], O. Sahin[1], M. Scott[1] and O. Solgaard[1]
[1]*Stanford University* and [2]*SINTEF 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. Kawazumi[1], S. Yasunaga[1], K. Ogino[2], H. Maeda[2], K.V. Gobi[3] and N. Miura[3]
[1]*Kinki University*, [2]*National Institute of Advanced Industrial Science and Technology* and [3]*Kyushu University*

ULTRASENSITIVE DETECTION OF ELECTROCHEMICAL REACTIONS BY THERMAL LENS MICROSCOPY FOR MICROCHIP CHEMISTRY
H.-B. Kim[1], T. Hagino[1], N. Sasaki[1] and T. Kitamori[1, 2]
[1]*University of Tokyo* and [2]*Kanagawa Academy of Science and Technology*

TRANSMISSION MICRO PIV RESOLVING VELOCITIES NORMAL TO THE FOCAL PLANE
L. Bitsch[1], L.H. Olesen[1], C.H. Westergaard[2], H. Bruus[1], H. Klank[1] and J.P. Kutter[1]
[1]*Technical University of Denmark* and [2]*Dantec Dynamics A/S*

MICRO PIV ON BLOOD FLOW IN A MICROCHANNEL
L. Bitsch[1], L.H. Olesen[1], C.H. Westergaard[2], H. Bruus[1], H. Klank[1] and J.P. Kutter[1]
[1]*Technical University of Denmark* and [2]*Dantec 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. Devasenathipathy[1], J.G. Santiago[1], T. Yamamoto[2], Y. Sato[2] and K. Hishida[2]
[1]*Stanford University* and [2]*Keio University*

INTEGRATING MULTIPLEXED PCR WITH CE FOR DETECTING MICROORGANISMS
Z.H. Fan[1, 2], A.J. Ricco[2, 3], W. Tan[2], M.-Q. Zhao[2] and C.G. Koh[2]
[1]*University of Florida*, [2]*ACLARA BioSciences* and [3]*NASA 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. Lee[1] and D.J. Beebe[2]
[1]*Dankook University* and [2]*University 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. Wallman[1], S. Ekström[1], J. Nilsson[1], G. Marko-Varga[2] and T. Laurell[1]
[1]*Lund Institute of Technology* and [2]*AstraZeneca Research & Development*

MICROSECOND MICROFLUIDIC MIXING FOR INVESTIGATION OF PROTEIN FOLDING KINETICS
D.E. Hertzog[1, 2], J.G. Santiago[1] and O. Bakajin[2]
[1]*Stanford University* and [2]*Lawrence Livermore National Laboratory*

COLORIMETRIC ANALYSIS CHIP CHECKING HEPATIC FUNCTIONS
A. Yokogawa[1], A. Oki[2], T. Shimasaki[1], H. Takasu[1] and Y. Horiike[2]
[1]*Rohm Co., Ltd.* and [2]*National 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. Sniadecki[1], R. Chang[1], M. Beamesderfer[2], C.S. Lee[1] and D.L. DeVoe[1]
[1]*University of Maryland* and [2]*NASA Goddard*

A FLOW SWITCH BASED ON CORIOLIS FORCE
T. Brenner, T. Glatzel, R. Zengerle and J. Ducrée
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. Fuchs[1], N. Manaresi[2], D. Freida[1], L. Altomare[3], C.L. Villiers[1], G. Medoro[2], A. Romani[3], I. Chartier[1], C. Bory[1], M. Tartagni[3], P.N. Marche[1], F. Chatelain[1] and R. Guerrieri[3]
[1]*CEA*, [2]*Silicon Biosystems* and [3]*University 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 µTAS SAMPLE HANDLING
P.R.C. Gascoyne[1], J.V. Vykoukal[1], T. Anderson[1], J. Noshari[1], F.F. Becker[1], K. Ratanachoo[2], K. Kandjanapa[2], J. Satayavivad[2] and M. Ruchirawat[2]
[1]*University of Texas M.D. Anderson Cancer Center* and [2]*Chulabhorn 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. Nagai[1], J. Takahashi[2] and S. Wakida[1]
[1]*National Institute of Advanced Industrial Science and Technology* and [2]*Daikin 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. Dodge[1], M.-C. Jullien[2], F. Okkels[1] and P. Tabeling[1]
[1]*ESPCI* and [2]*ENS-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. Baroud[1], L. Menetrier[2], F. Okkels[2] and P. Tabeling[2]
[1]*Ecole Polytechnique* and [2]*ESPCI*

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. Rodd[1], G. Rosengarten[1], S.T. Huntington[1], K. Lyytikainen[2], D.V. Boger[1] and J.J. Cooper-White[1]
[1]*University of Melbourne* and [2]*University 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 EMBOSSING OF 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. Shediac, 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. Kanno[1], S. Kawano[2], S. Yakushiji[1] and H. Kotera[1]
[1]*Kyoto University* and [2]*Tohoku 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. Jenkins[1], B. Prabhakarpandian[1], K. Lenghaus[2], J. Hickman[2] and S. Sundaram[1]
[1]*CFD Research Corporation* and [2]*Clemson 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. Sugiyama[1], S. Kase[1, 2] and Y. Horiike[3]
[1]*Toyo University*, [2]*Japan Science and Technology Corporation* and
[3]*National Institute for Materials Science*

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

DEVELOPMENT OF MICRO NEEDLE-HEAD SLIDE VALVE UNIT FOR MIICROFLUIDIC DEVICES
K. Morishima[1], M. Ohnishi[1], M. Tokeshi[1] and T. Kitamori[1,2,3]
[1]*Kanagawa Academy of Science and Technology*, [2]*University of Tokyo* and
[3]*Japan Science and Technology Corporation*

MEMS Technology

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. Rocklin[1], H. Yin[1], D. Sobek[1], P. Coufal[2] and K. Killeen[1]
[1]*Agilent Technologies Inc.* and [2]*Charles University*

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

Materials

PRECONCENTRATION OF PROTEINS ON CHIP USING A PHOTOINITIATED POLYMER MONOLITH CONTAINING IMMOBILIZED TANNIC ACID
L.M. Barrett[1, 2], F. Svec[3] and Y. Fintschenko[2]
[1]*Loughborough University*, [2]*Sandia National Laboratories* and [3]*University of California, Berkeley*

NOVEL SURFACE MODIFICATION METHODS AND SURFACE PROPERTY ANALYSIS FOR SEPARATION OF DNA BIO-MOLECULES USING CAPILLARY ELECTROPHORESIS
C.-H. Lin[1], L.-M. Fu[2], K.-H. Lee[3], R.-J. Yang[3] and G.-B. Lee[3]
[1]*National Sun Yat-Sen University*, [2]*National Pingtun University of Science and Technology* and [3]*National 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. Ressine[1], G. Marko-Varga[2] and T. Laurell[1]
[1]*Lund Institute of Technology* and [2]*Lund 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. Choi[1], Z. Zhang[1], P. Boccazzi[1], P.E. Laibinis[2], A.J. Sinskey[1] and K.F. Jensen[1]
[1]*Massachusetts Institute of Technology* and [2]*Rice 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

SU8 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. Morishima[1], Y. Tanaka[2], K. Sato[2,3], M. Ebara[4], T. Shimizu[5], M. Yamato[5], A. Kikuchi[5], T. Okano[5] and T. Kitamori[1, 2,3]
[1]*Kanagawa Academy of Science and Technology*, [2]*University of Tokyo*, [3]*Japan Science and Technology Corporation*, [4]*Waseda University* and [5]*Tokyo Women's Medical University*

AUTOMATIC TRANSPORTATION OF A DROPLET ON A WETTABILITY GRADIENT SURFACE
T. Yasuda[1], K. Suzuki[2] and I. Shimoyama[2]
[1]*Kyushu Institute of Technology* and [2]*University of Tokyo*

Applications

CONVECTIVELY 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. Wolff[1], I.R. Perch-Nielsen[1], C.R. Poulsen[1], J. El-Ali[1] and D.D. Bang[2]
[1]*Technical University of Denmark* and [2]*Danish 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 CYTOMETERY
J. Vykoukal[1], J.A. Schwartz[1], P.R.C. Gascoyne[1], C. Yu[2] and L. Shi[2]
[1]*University of Texas M.D. Anderson Cancer Center* and [2]*University 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. Roy[1], J.T. Kellis[2], A.J. Polouse[2], C.R. Robertson[1] and A.P. Gast[3]
[1]*Stanford University*, [2]*Genencor International Inc.* and
[3]*Massachusetts Institute of Technology*

CHIP-BASED RISK EVALUATION SYSTEM FOR CHEMICALS USING E.COLI
M. Tokeshi[1], S. Hiki[2], Y. Akiyama[2], K. Morishmia[1], K. Sato[3] and T. Kitamori[1, 3]
[1]*Kanagawa Academy of Science and Technology*,
[2]*Institute of Microchemical Technology* and [3]*University of Tokyo*

SIZE DEPENDENT MOBILITY OF DNA IN ELECTRIC AND HYDRO DRAG FORCE FIELD
Y. Takamura[1], Y. Horiike[2], Y. Baba[3] and E. Tamiya[1]
[1]*Japan Advanced Institute of Science and Technology*,
[2]*National Institute of Materials Science* and [3]*University 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 SPLITT 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. Chou[1], R. Lenigk[1], D. Sadler[2], R. Changrani[3],
S. O'Rourke[1], R. Liu[1] and F. Zenhausern[1]
[1]*Arizona State University*, [2]*Motorola Labs* and [3]*Northwestern University*

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

Detection Technologies

FIRST MEASUREMENT RESULTS WITH INTEGRATED PROJECTION CYTOMETER
J.H. Nieuwenhuis[1], J. Bastemeijer[2], P.M. Sarro[2] and M.J. Vellekoop[1]
[1]*Vienna University of Technology* and [2]*Delft University of Technology*

A NOVEL HIGH-FREQUENCY SENSOR FOR BIOLOGICAL DISCRIMINATION
T.C. Messina[1], L.N. Dunkleberger[1], G.A. Mensing[2], A.S. Kalmbach[3], R. Weiss[3], D.J. Beebe[2] and L.L. Sohn[1]
[1]*University of California, Berkeley,* [2]*University of Wisconsin* and [3]*Princeton 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. Zhu[1], C. Kimball[1], N. Sniadecki[1], M. Beamesderfer[2], S. Semancik[3], and D.L. DeVoe[1]
[1]*University of Maryland,* [2]*NASA Goddard Space Flight Center* and [3]*National 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. Nichols[1], C.-J. Lu[1], P.L. Bergstrom[1, 3], R.P. Manginell[2], G.C. Frye-Mason[2] and E.T. Zellers[1]
[1]*University of Michigan*, [2]*Sandia National Laboratories* and [3]*Michigan 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

WEDNESDAY *CONTINUED*

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. Kim[1], K.S. Hwang[2], J.H. Lee[1], J.B. Park[1], J.H. Park[2]
[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. Stelzle[1], M. Dürr[1], G. Gradl[3], P. Geggier[2], A. Haage[4], R. Hagedorn[5], M. Jäger[2], J. Kentsch[1], T. Müller[5], A. Normann[4] and T. Schnelle[3]
[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. Go[1], E.H. Jeong[2], K.C. Kim[3], S.Y. Yoon[3] and S. Shoji[1]
[1]*Waseda University,* [2]*Japan Science and Technology Corporation* and [3]*Pusan National University*

COMBINING DROPLET-BASED LIQUID HANDLING AND ON-CHIP CAPILLARY ELECTROPHORESIS WITH A NEW SAMPLE INJECTION METHOD
S. Kaneda and T. Fujii
University of Tokyo

4:15 – 5:15 pm
Applications

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. Puntambekar[1], C. Hong[1], C. Gao[1], X. Zhu[1], R. Trichur[1], J. Han[1], S. Lee[1], J. Kai[1], J. Do[1], R. Rong[1], S. Chilukuru[1], M. Dutta[1], L. Ramasamy[1], S. Murugesan[1], R. Cole[1], J. Nevin[1], G. Beaucage[1], J.B. Lee[2], J.Y. Lee[3], M. Bissell[3], J.W. Choi[1] and C.H. Ahn[1]
[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. Nonaka[1], S. Toyomura[1] and T. Kitamori[1, 2, 3]
[1]*University of Tokyo*, [2]*Kanagawa Academy of Science and Technology* and [3]*Japan 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. Kaneda[2], S. Camou[2] and T. Fujii[2]
[1]*Enplas Laboratories*, Inc. and [2]*University 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. Kaji[1], Y. Takamura[2], Y. Horiike[2], H. Nakanishi[3], T. Nishimoto[3] and Y. Baba[1, 4]
[1]*University of Tokushima*, [2]*University of Tokyo*, [3]*Shimadzu Corporation* and [4]*National Institute of Advanced Industrial Science and Technology*

SELF-CONTAINED, INTEGRATED BIOCHIP SYSTEM FOR SAMPLE-TO-ANSWER GENETIC ASSAYS
R.H. Liu[1], J. Yang[1], R. Lenigk[1], J. Bonanno[1], P. Grodzinski[2] and F. Zenhausern[1]
[1]*Arizona State University* and [2]*Los 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

LODGING INFORMATION

The Resort at Squaw Creek is a premier California meeting and vacation destination. It's large meeting facility adjacent to the hotel will offer championship golf, tennis, spa services,biking and hiking trails for options when the meeting is not in session. The perfect mix of expertly prepared cuisine and the natural beauty of the many distinctive restaurants will create a satisfying taste of fresh air flavors. This combined with waking up to a valley or forest view from 400+ show case rooms which include many with fireplaces and windows that open to the fresh, pine-scented air will give you an experience you'll never forget. Visit www.squawcreek.com for further information and viewing room floor plans

.

Reservations can be made on their website at *www.squawcreek.com*.

To ensure that you receive the special group rate, use the conference code **MicroTAS** to make your reservations. Alternatively, fax or mail your hotel reservation form directly to the Resort at Squaw Creek by *September 12, 2003*.

MicroTAS 2003

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Web site: http://www.squawcreek.com/

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For more information on the Resort at Squaw Creek please visit their website at: *www.squawcreek.com*

Hotel confirmations will be sent directly to you from the Resort at Squaw Creek. A credit card is required to guarantee all reservations with a one night advance deposit due at the time of booking. Reservations must be cancelled 7 days in advance of arrival date. Check-in time is 4:00 p.m. Check-out time for all guests is 11:00 a.m. There will be a $12.00 per night, per room Resort Fee added to all room rates. The Resort Fee includes the following:

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- Valley shuttle service to Squaw Valley and Tahoe City/Lake Tahoe
- in-room coffee service
- 800 & local calls (free for 1st 30 min., 10 cents per min. after that)
- incoming faxes
- unlimited use of the Resort's Health Club facilities
- bike rentals (up to 4 hrs)
- tennis (court fees, racket & ball rentals)
- croquet rentals
- miniature golf (play & rental),
- basketball
- badmiton
- ping pong
- pool toys

MicroTAS 2003
LODGING RESERVATION FORM

Resort at Squaw Creek, Olympic Valley, California, USA

You must identify yourself as an attendee of MicroTAS to receive the group room rate.

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Or call, mail or fax this form to: ***MicroTAS 2003***
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Olympic Valley, CA 96146
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Fax: 1-530-581-6647

Reservation Deadline: September 12, 2003

Last Name _____ First Name _____

Institute/Organization _____

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City _____

State/Province _____ Zip/Postal Code _____

Country _____ Email _____

Telephone _____ Fax _____

Number of people sharing room with you _____

Arrival Date _____ Departure Date _____

Room Reservation: These non-commissioned rates are subject to a room tax, presently at 12.5%. Reservations made after September 12, 2003 will be confirmed subject to availability of space and special group rate.

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  (1 King Bed or 2 Queen Beds)
- ☐ $195.00 per night/Mountain Suites
  (1 bedroom suite with Queen Sofa Sleeper, sleeps up to 4 people at no additional charge)
- ☐ $295.00 per night/Fireplace Suites
  (1 bedroom suite with Queen Sofa Sleeper, sleeps up to 4 people at no additional charge)
- ☐ Smoking ☐ Non-smoking

A credit card is required to guarantee all reservations with a 1 night advance deposit due at the time of booking. Reservations must be cancelled 7 days in advance of arrival date. There will be a $12 per night, per room Resort Fee added to all room rates. Please see page 40 for a listing of what is included in the Resort Fee.

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MicroTAS 2003

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PLEASE TYPE OR PRINT CLEARLY

First Name _____ Last Name _____

Nametag _____

Degree - M.D./Ph.D./Other _____ Position/Title _____

Institute/Organization _____

Department _____ Division _____

Business Address _____

City _____ State/Province _____

Zip/Postal Code _____ Country _____

Telephone _____ Fax _____

E-mail _____

☐ *Yes* ☐ *No* Name on electronic mailing list to be available to commercial supporters and conference attendees

If you require special arrangements, please indicate your request below:

☐ Dietary: _____ ☐ Physical: _____

Registration payment, in U.S. Dollars only, is due upon submission of registration.

The fee includes program material, (1) technical digest, refreshment breaks, and a 20% non-refundable cancellation fee. All requests for cancellations are to be made in writing. No refunds will be made after September 26, 2003. A $50 fee will be charged for all substitutions. If you have any questions contact PMMI at *info@microtas2003.org* or call 1-619-232-9499.

REGISTRATION FEE

	Early Bird	*Advanced*	*On-Site*	
	On or Before 08-15-03	After 08-15-03	On or After 09-19-03	
☐ Standard	$760	$835	$960	$ _____
☐ Student without meals*	$435	$475	$510	$ _____
☐ Student*	$585	$635	$695	$ _____
*Include Advisors Name: _____				
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☐ Banquet		$60 *(each)*	x _____	$ _____
			TOTAL	$ _____

ADDITIONAL TECHNICAL DIGEST FEE

(Registration fee includes 1 Technical Digest)

☐ *Does not include shipping*	$150 *(each)*	x _____	$ _____
		TOTAL	$ _____
		GRAND TOTAL	$ _____

FORM OF PAYMENT

☐ Bankwire Transfer *(Bankwire information will be sent to you upon receipt of this form)*

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