

μTAS BOSTON
2005
MICRO TOTAL ANALYSIS SYSTEMS



Final Program

Ninth International Conference on Miniaturized
Systems for Chemistry and Life Sciences

October 9-13, 2005

Boston, Massachusetts USA

Sponsored by
The Transducer Research Foundation



program at a glance

Sunday	4:00 p.m. - 7:00 p.m.	Registration		
	5:00 p.m. - 7:00 p.m.	Wine & Cheese Welcome Reception		
Monday	8:30 a.m. - 8:45 a.m.	Opening Remarks		
	8:45 a.m. - 9:25 a.m.	PLENARY I		
	9:30 a.m. - 10:30 a.m.	Session 1A1 Clinical System		Session 1B1 Flow Transport & Imaging
	10:30 a.m. - 11:00 a.m.	Break		
	11:00 a.m. - 12:00 noon	Session 1A2 Immunoassay		Session 1B2 Mixing / Pumping
	12:00 noon - 1:30 p.m.	Grab 'n Go Lunch		
	1:30 p.m. - 2:10 p.m.	PLENARY II		
	2:15 p.m. - 4:30 p.m.	Poster Session 1		
	4:30 p.m. - 5:30 p.m.	Session 1A3 Electrokinetic Separation		Session 1B3 Droplet
	Tuesday	8:30 a.m. - 9:10 a.m.	PLENARY III	
9:15 a.m. - 10:15 a.m.		Session 2A1 Cell Manipulation		Session 2B1 Nano Channel Fabrication
10:15 a.m. - 10:45 a.m.		Break		
10:45 a.m. - 11:45 a.m.		Session 2A2 Integrated Cell Culture/Analysis Systems		Session 2B2 MicroFabrication
11:45 a.m. - 1:30 p.m.		Grab 'n Go Lunch		
1:30 p.m. - 2:10 p.m.		PLENARY IV		
2:15 p.m. - 4:30 p.m.		Poster Session 2		
4:30 p.m. - 5:30 p.m.		Session 2A3 DNA & Protein Detection		Session 2B3 DNA Analysis
7:00 p.m.	Banquet <i>"Evening in the Stars"</i>			
Wednesday	8:30 a.m. - 9:10 a.m.	PLENARY V		
	9:10 a.m. - 9:15 a.m.	Announcement of MicroTAS 2006		
	9:15 a.m. - 10:15 a.m.	Session 3A1 New Continuous Separation Devices		Session 3B1 Highly Sensitive Optical Detection
	10:15 a.m. - 10:45 a.m.	Break		
	10:45 a.m. - 11:45 a.m.	Session 3A2 Separations & Nanostructures Systems		Session 3B2 Arrays
	11:45 a.m. - 1:30 p.m.	Grab 'n Go Lunch		
	1:30 p.m. - 2:10 p.m.	PLENARY VI		
	2:15 p.m. - 4:30 p.m.	Poster Session 3		
4:30 p.m. - 5:30 p.m.	Session 3A3 Integrated DNA Analysis		Session 3B3 Particle Separation & Manipulation	
Thursday	8:30 a.m. - 9:10 a.m.	Poster Awards Ceremony		
	9:15 a.m. - 10:15 a.m.	Session 4A1 Continuous Free Flow Devices		Session 4B1 Nanostructures
	10:15 a.m. - 10:45 a.m.	Break		
	10:45 a.m. - 11:45 a.m.	Session 4A2 Protein Analysis		Session 4B2 Fluids - Basics
	11:45 a.m.	Conference Adjourns		



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welcome

● ● ● ● TO BOSTON

μ TAS 2005 continues to evolve as the leading conference bringing together microfluidics, micro- and nanotechnology, material science, chemistry biology, and medicine into interdisciplinary international forum for discussing research and applications in miniaturized systems for chemistry and life sciences. This year the response from the scientific community has again been larger than ever before. The μ TAS Steering Committee had the challenging task of selecting 520 papers from the 832 abstracts submitted. In keeping with the tradition of μ TAS, high standards were applied to the selection process requiring significant application data and results from state-of-the-art science and technology, so that participants would continue to experience the highest level of advancements in the field.

The three and half day technical program consists of six plenary sessions, two daily parallel oral sessions of 66 contributed papers, and three poster sessions of 454 papers. Plenary presentations by worldwide recognized scientist explore core and new application areas of μ TAS, including miniaturized systems for drug delivery, tissue engineering; cell growth, and individual genes and proteins; new tools and opportunities in microfabrication, microfluidics, and biomedicine; molecular motors and bearings; and single-molecule reactions. The contributed presentations and posters expand upon these and other μ TAS themes in microfluidics, microfabrication, nanotechnology, integration, materials & surfaces, analysis & synthesis, and detection technologies for life science and chemistry. The program promises an exciting conference with new scientific advances being disclosed and discussed in an open environment with ample opportunities for intense international networking across disciplines.

Boston's history, vibrant neighborhoods, concentration of life science, and numerous academic institutions provide an exciting backdrop for the conference. In addition to enjoying the depth, breadth, and high quality of the conference, we hope that you will find opportunity to enjoy the city and the surrounding New England country side in its vibrant autumn colors.

On behalf of the μ TAS 2005 Steering and Program Committee welcome to Boston and thank you for your enthusiastic participation in the μ TAS Conference and community.



Klavs F. Jensen
Chairman, μ TAS 2005



CONFERENCE CHAIR

Klavs F. Jensen

Massachusetts Institute of Technology

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photo courtesy of Lee Irons



conference location

All sessions will be held at the Boston Marriott Copley Place.

Boston Marriott Copley Place

110 Huntington Avenue, Boston, MA 02116 USA

Phone: 1-800-228-9290 or 1-617-236-5800 **Fax:** 1-617-937-5685

Web site: www.bostonmarriottcopleyplace.com

registration and information desk

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

Sunday, October 9th 4:00 p.m. - 7:00 p.m.

Monday, October 10th 7:00 a.m. - 5:45 p.m.

Tuesday, October 11th 8:00 a.m. - 5:45 p.m.

Wednesday, October 12th 8:00 a.m. - 5:45 p.m.

Thursday, October 13th 8:00 a.m. - 12:00 p.m.

information/message board

The Information/Message Board will be located near the Registration Desk. Messages will be posted in this area throughout the Conference.

name badges

All attendees must wear their name badge at all times to gain admission to all conference sessions, exhibits and receptions.

grab 'n go lunch

To enhance your time in the exhibit and poster area, all lunches will be served as a grab 'n go box lunch. Seating areas are available throughout the hotel and outside. Please find your lunch tickets behind your name badge to exchange for your box lunch.

meeting room logistics

Please contact the Conference Registration Desk if you find the temperature in the room uncomfortable or you are unable to hear or see because of equipment difficulties.

We would appreciate your assistance in keeping the hotel clean. Please use trash receptacles for all of your disposables (especially your box lunches).

evaluation

There is a conference evaluation form in your packet. Your feedback is very important to the improvement and development of this Conference. Please return completed form to the Conference Registration Desk.

technical digest and CD-ROM

An extended abstract of each paper presented at the Conference has been published in a Technical Digest and on a CD-ROM. One copy of the Digest and the CD-ROM is included in your bag. Additional copies may be purchased at the Conference. Purchase price of the Technical Digest will increase after the conference, so be sure to order your additional copies in advance.

additional technical digest

Your registration fee includes (1) Technical Digest.

Additional Technical Digest \$100.00 (each)
(Price does not include shipping)

smoking

All meeting rooms and seated functions are smoke free. Please regard the smoking policy of the Boston Marriott Copley Place and use designated smoking areas only.

job market board

Please visit the Job Market Board located in the exhibit hall near the entrance to see current job opportunities or to place your resume on the board.



chimes

The chimes will ring 5 minutes before the end of each scheduled break. The sessions will begin on time, so please return to the sessions when you hear the chimes.

wireless /wired internet

Wireless internet is available to purchase on the first and second floors of the Boston Marriott Copley Place. The rate is \$9.95 for a 24 hour period. You will need a credit card to access. For those that do not have wireless internet access, wired internet is available in all guests rooms for \$9.95 for a 24 hour period and can be charged to your guest room. If you incur any problems, please contact the hotel operator and they will assist you.

cellular phones, pagers and watch alarms

Out of courtesy to our speakers and other attendees, please turn off any cellular phones, pagers and watch alarms during sessions.

cameras and tape recorders

Cameras and tape recorders are strictly prohibited in the sessions, poster presentations and the exhibit areas. Film or video will be confiscated.

shipping service

If you need to ship or mail any packages, please visit Mail Boxes Etc. located on the first floor of the Boston Marriott Copley Place near the hotel check-in, Monday - Friday, 7:00 a.m. - 10:00 a.m.

official language

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

currency exchange

Only US dollars are acceptable at regular stores and restaurants. The exchange rate fluctuates daily. Visit the website at www.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.

tipping

15% is standard for meals. \$1.00/bag to skycaps, doormen, porters, and bellmen.

subway

The Massachusetts Bay Transportation Authority (MBTA), known locally as the 'T', provides direct service to just about anywhere in Metropolitan Boston. There are four main lines (Blue, Green, Orange and Red) which run into the downtown area and out to different suburbs. Fares are \$1.25 locally and \$1.25-\$3.00 for zone changes. The 'T' starts operating at 5:00 a.m. and the last train leaves downtown Boston at 12:45 a.m.

car rental

The Conference has selected *Budget* as the official car rental company. If you should need to rent a car during your stay in Boston, you can contact Budget at the following number: 1-800-772-3773

Refer to BCD#: U061726



social program

SUNDAY WELCOME RECEPTION

An informal Wine and Cheese Welcome Reception will be held in conjunction with registration from 5:00 p.m. – 7:00 p.m. The reception will be held in Salon E of the Boston Marriott Copley Place.

CONFERENCE BANQUET

Evening in the Stars

Tuesday, October 11, 2005 - 7:00 p.m.

Join us for an "Evening in the Stars" at The Skywalk.

Enjoy the Skywalk View and Exhibits on the 50th floor of the Prudential Tower which is adjacent to the Marriott. The evening will enable you to discover all of Boston, from its founding to the present. It uses the panoramic views of the city as prompts to highlight people and sites, which make the city special. Twenty nine different exhibits present approximately 300 pieces of information that show what is behind the 360 degree view.

Come see the city with new eyes. The exhibit uses the dramatic views from the Skywalk as the keys for the displays. Boston's diverse neighborhoods, famous and not-so-famous people from Julia Child and John F. Kennedy to Paul Revere, memorable quotes and architecture are highlights of the exhibit. Explore a variety of displays, such as the "Faces Wall" with portraits of some of the men and women who contributed to the story of Boston.

Join us for a wonderful evening of food, drinks, conversation and the breathtaking, panoramic views of the Boston skyline and beyond. Tickets are required and may be purchased at registration by noon on Monday.

Ticket. \$60.00



We gratefully acknowledge, at the time of printing, the support of the conference from the following:

sponsor



contributors



Royal Society of Chemistry



YOLE DÉVELOPPEMENT

exhibitors

Exhibitors are located in the University of Massachusetts Exhibit Hall. Please see floorplan on page 11.

exhibitor	booth
Applied Micro Structures, Inc.	26
4425 Fortran Drive San Jose, CA 95134 USA Phone: 1-408-907-2822 Fax: 1-408-719-9102 Website: www.appliedmst.com	
BioForce Nanosciences Inc.	6
1615 Golden Aspen Drive, Suite 101 Ames, IA 50010 USA Phone: 1-515-233-8333 Fax: 1-515-233-8337 Website: www.bioforcenano.com	
BioMEMS Resource Center	18
Massachusetts General Hospital MGH-CNY, 114 16th Street, Rm 1239 Boston, MA 02129 USA Phone: 1-617-371-4883 Fax: 1-617-724-2999 Website: www.biomemsrc.org	
Cascade MicroTech	1
2430 NW 206th Avenue Beaverton, OR 97006 USA Phone: 1-503-601-1000 Fax: 1-503-601-1601 Website: www.cascademicrotech.com	
CLP MicroTechnologies Inc.	table top
P.O. Box 3244 Boulder, CO 80307 USA Phone: 1-303-492-0475 Fax: 1-303-492-4341 Website: www.clpmt.com	



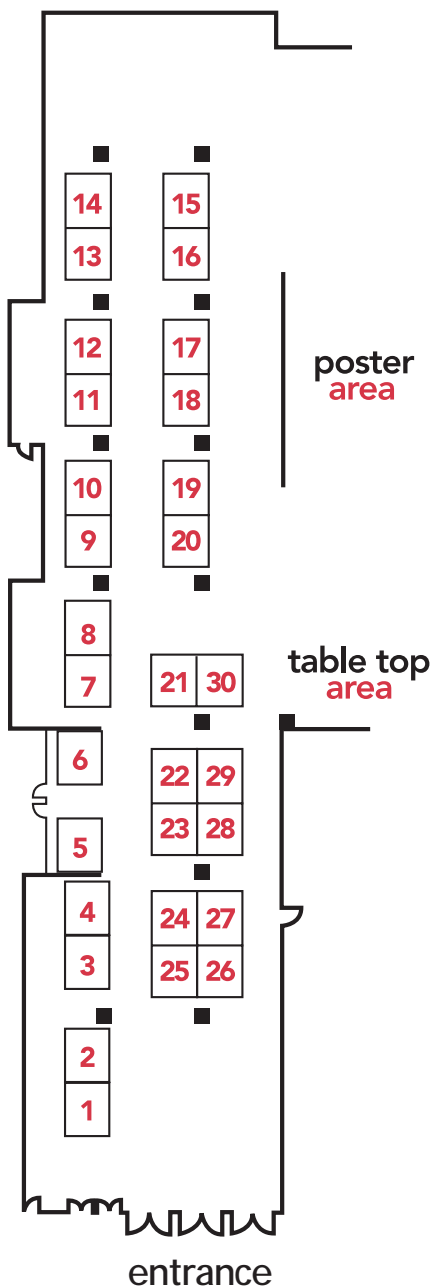
- CMA/Microdialysis** table top
 73 Princeton Street
 N. Chelmsford, MA 01863 USA
 Phone: 1-800-440-4980
 Fax: 1-978-251-1950
 Website: www.microdialysis.com
- EV Group, Inc.** 20
 7700 South River Parkway
 Tempe, AZ 85284 USA
 Phone: 1-480-727-9600
 Fax: 1-480-727-9700
 Website: www.evgroup.com
- FLUIGENT** 2
 Pav. G. Roussy, 27 Rue Fbg. St. Jacques
 Paris, 75014 FRANCE
 Phone: 33-153-105-313
 Fax: 33-153-105-313
 Website: www.fluigent.com
- FRT of America, LLC** table top
 48 South Road, #1
 Somers, CT 06071 USA
 Phone: 1-860-749-3885
 Fax: 1-860-749-3899
 Website: www.frtofamerica.com
- Heidelberg Instruments** 9
 2807 Oregon Court, Unit E2
 Torrance, CA 90503 USA
 Phone: 1-310-212-5021
 Fax: 1-310-212-5254
 Website: www.heidelberg-instruments.com
- Institute of Microchemical Technology** table top
 KSP East #207, 3-2-1 Sakado
 Kawasaki-Shi, Kanagawa-Ken, 213-0012 JAPAN
 Phone: 81-44-811-6521
 Fax: 81-44-814-5545
 Website: www1.odn.ne.jp/imt
- Intelligent Micro Patterning, LLC** 10
 1922 Illinois Avenue NE
 St. Petersburg, FL 33703 USA
 Phone: 1-727-522-0334
 Fax: 1-727-522-3896
 Website: www.intelligentmp.com
- IntelliSense Software Corporation** table top
 600 W. Cummings Park, Ste 2000
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Website: www.jo-mt.com
- Lab on a Chip (Royal Society of Chemistry)** 14
Thomas Graham House, Science Park, Milton Road
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Fax: 44-1223-420247
Website: www.rsc.org/loc
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1159 Rebecca Drive
Livermore, CA 94550 USA
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1253 Hamilton Parkway
Itasca, IL 60143 USA
Phone: 1-630-760-1000
Fax: 1-630-760-1001
Website: www.leisterusa.com
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CBM2
Baton Rouge, LA 70803 USA
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Fax: 1-225-578-5799
Website: www.lsu.edu/cbmm
- MicroChem Corp./DuPont Advanced Packaging Lithograph** 4
1254 Chestnut Street
Newton, MA 02464 USA
Phone: 1-617-965-5511
Fax: 1-617-965-5818
Website: www.microchem.com
- MicroConnex** table top
34935 SE Douglas Street
Snoqualmie, WA 98065 USA
Phone: 1-425-396-5707
Fax: 1-425-396-5861
Website: www.microconnex.com
- Micronit Microfluidics bv** 8
P.O. Box 545
Enschede, 7500 AM THE NETHERLANDS
Phone: 31-53-483-6584
Fax: 31-53-4836-580
Website: www.micronit.com
- NSG Precision Cells, Inc.** 25
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 Fax: 1-408-433-9904
 Website: www.oainet.com
- Ritek Corporation** 17
 No. 42 Kuan-Fu N. Road
 Hsin-Chu County, 30316 TAIWAN
 Phone: 886-3-598-5696
 Fax: 886-3-59-7848
 Website: www.ritek.com.tw
- Seika Corporation** 29
 New Tokyo Bldg., 3-3-1 Marunouchi
 Tokyo, 100-0005 JAPAN
 Phone: 81-3-5221-7119
 Fax: 81-3-5221-7136
 Website: www.seika-mt.com
- Silex Microsystems** 7
 Bruttov. 1
 Jarfalla, 17526 SWEDEN
 Phone: 46-85-80-249-00
 Fax: 46-85-80-249-01
 Website: www.silexmicrosystems.com
- Siloam Biosciences, LLC** 27
 3130 Highland Avenue, Suite 3235
 Cincinnati, OH 45219 USA
 Phone: 1-513-475-6650
 Fax: 1-513-221-1891
 Website: www.siloambio.com
- TSI Incorporated** 21
 500 Cardigan Road
 Shoreview, MN 55126 USA
 Phone: 1-800-874-2811
 Fax: 1-651-490-3824
 Website: http://piv.tsi.com
- UltraSource, Inc.** 5
 22 Clinton Drive
 Hollis, NH 03049 USA
 Phone: 1-603-881-7799
 Fax: 1-603-881-9966
 Website: www.ultrasource.com
- Ulvac Technologies, Inc.** table top
 401 Griffin Brook Drive
 Methuen, MA 01844 USA
 Phone: 1-978-686-7550
 Fax: 1-978-689-6300
 Website: www.ulvac.com
- Yole Développement and Micronews** 24
 45 rue Sainte Geneviève
 Lyon, 69006 FRANCE
 Phone: 33-47-283-0189
 Fax: 33-47-283-0183
 Website: www.yole.fr



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 during the first three days of the conference. There will be two parallel oral sessions each day.

guide to understanding session numbering

Each session in the technical program is assigned a unique number which clearly indicates when and where the session is presented. The number of each session is shown before the session title. A typical number is shown below:

Typical Session Number: **1A1**

The first character (i.e., 1) indicates the day of the conference:

- 1 = Monday
- 2 = Tuesday
- 3 = Wednesday

The second character (i.e., A) indicates which ballroom the session is held in.

- A = Salon F/G
- B = Salon E

The third character (i.e., 1) shows which time of the day the session is held.

- 1 = Morning
- 2 = Mid Morning
- 3 = Afternoon

posters

Three poster sessions will be held in the University of Massachusetts Exhibit Hall on the third floor, from 2:15 p.m. to 4:30 p.m. each day. Posters will be on display and authors will be available for questions during their appointed time. All poster papers are listed in this program on the day that they are on display. See poster floorplan on page 60.

guide to understanding poster numbering

Each poster in the technical program is assigned a unique number which clearly indicates when and where the poster is presented. The number of each poster is shown on the left-hand side, before the title. A typical number is shown below:

Typical Poster Number: **M-1-A**

The first character (i.e., M) indicates the day of the conference that the poster will be on display.

- M = Monday
- T = Tuesday
- W = Wednesday

The second character (i.e., 1) is the poster board position on the floor plan.

The third character (i.e., A) shows the category of the poster.

- A = Microfluidics
- B = Microfabrication
- C = Nanotechnology
- D = Materials & Surfaces
- E = Applications
- F = Detection Technologies



Sunday, October 9, 2005

- 4:00 p.m. - 7:00 p.m. | Registration
- 5:00 p.m. - 7:00 p.m. | Wine and Cheese Welcome Reception

Monday, October 10, 2005

- 8:30 a.m. - 8:45 a.m. | Opening Remarks
- 8:45 a.m. - 9:25 a.m. | **Plenary I**
Chair: **K.F. Jensen, Massachusetts Institute of Technology**
MINIATURIZED SYSTEMS FOR DRUG DELIVERY AND TISSUE ENGINEERING
R.S. Langer
Massachusetts Institute of Technology, USA

SALON F/G	SALON E
Session 1A1 Clinical System Session Chair: Y. Baba, Nagoya University	Session 1B1 Flow Transport & Imaging Session Chair: J.-L. Viovy, Curie Institute

9:30 AM - 9:50 AM

RAPID ALCOHOL TESTING IN WHOLE BLOOD BY DISK-BASED REAL-TIME ABSORPTION MEASUREMENT
 J. Steigert, L. Riegger, M. Grumann, T. Brenner, J. Harter, R. Zengerle, and J. Ducreé
IMTEK, University of Freiburg, GERMANY

CONVECTION-LIMITED SURFACE TRANSPORT IN NANOFUIDIC CHANNELS
 T. Gervais, C. Tsau, J. El-Ali, S.R. Manalis, and K.F. Jensen
Massachusetts Institute of Technology, USA

9:50 AM - 10:10 AM

ANALYSIS OF SALIVA SAMPLES FOR END-STAGE RENAL DISEASE DIAGNOSTICS USING AN IMAGING FIBER-OPTIC MULTIPLEXED MICROARRAY
 D.R. Walt, D. Rissin, C. DiCesare, T. Blicharz, and R. Hayman
Tufts University, USA

A DETECTION METHOD OF 3D PARTICLE-POSITIONS AND 3D MICROFLOW DIAGNOSTIC METHOD IN A MICROFLUIDICS
 S.Y. Yoon and K.C. Kim
Pusan National University, KOREA

10:10 AM - 10:30 AM

DIFFERENTIAL EXTRACTION OF MALE AND FEMALE DNA IN AN AUTOMATED MICROFLUIDIC DEVICE
 A.J. Devitt, N. Aflatooni, M. Vinas, N. Loh, F. Pourahmadi, R. Yuan, and M.A. Northrup
Microfluidic Systems, USA

3D HIGH-SPEED TIME-RESOLVED FLUORESCENCE IMAGING OF SOLVENT INTERACTIONS IN MICROFLUIDIC DEVICES
 R.K.P Benninger, O. Hofmann, J. McGinty, J. Requejo-Isidro, I. Munro, M.A.A. Neil, A.J. deMello, and P.M.W. French
Imperial College London, UK

10:30 a.m. - 11:00 a.m. | Break

SALON F/G	SALON E
Session 1A2 Immunoassay Session Chair: P. Yager, University of Washington	Session 1B2 Mixing / Pumping Session Chair: P. Doyle, Massachusetts Institute of Technology

11:00 AM - 11:20 AM

NONSPECIFIC BINDING REMOVAL WITH ULTRASONIC MICRODEVICES
 G.D. Meyer¹, J.M. Moran-Mirabal¹, D.W. Branch², and H.G. Craighead¹
¹Cornell University, USA and
²Sandia National Laboratories, USA

MICROFLUIDIC SERIAL TRANSFER CIRCUIT: AUTOMATED EVOLUTION OF RNA CATALYSTS
 B.M. Paegel and G.F. Joyce
The Scripps Research Institute, USA

11:20 AM - 11:40 AM

A POLYMER LAB-ON-A-CHIP FOR MAGNETIC IMMUNOASSAY WITH ON-CHIP SAMPLING AND DETECTION CAPABILITIES

J. Do and C.H. Ahn

University of Cincinnati, USA
PERVAPORATION-DRIVEN MICROPUMPS: APPLICATION TO CRYSTALLINE GROWTH
J. Leng¹, B. Lonetti¹, P. Tabeling¹, A. Ajdari¹, and M. Joanicot²¹ESPCI, FRANCE and²Laboratory Of Future, FRANCE

11:40 AM - 12:00 PM

MICROFLUIDIC SANDWICH IMMUNOASSAYS FOR SUB-FEMTOMOLE DETECTION USING MAGNETIC FIELD-INDUCED NANOPARTICLES

J.H. Kang, Y.K. Hahn, K.S. Kim, and J.K. Park

Korea Advanced Institute of Science and Technology, KOREA
INTEGRATED FLUID INJECTORS AND MIXERS FOR pH CONTROL IN MINIATURE BIOREACTOR ARRAYS

H.L.T Lee and R.J. Ram

Massachusetts Institute of Technology, USA

12:00 p.m. - 1:30 p.m.

Grab 'n Go Lunch

1:30 p.m. - 2:10 p.m.

Plenary II
Chair: **D.J. Harrison**, *University of Alberta*
SUPRAMOLECULAR METAL ARRAYS AND METAL-MEDIATED MOLECULAR MOTIONS: ARTIFICIAL METALLO-DNA AND PEPTIDES, MOLECULAR BALL BEARINGS AND CONTAINERS

M. Shionoya

University of Tokyo, JAPAN

2:15 p.m. - 4:30 p.m.

Poster Session 1 (floorplan on page 60)
microfluidics - fluid manipulation

- M1A** | **A BIOMIMETIC ELASTOMERIC CHECK VALVE WITH DIODE BEHAVIOR**
P.J. Hung, P.J. Lee, J.C. Hu, J. Chen, V.M. Rao, and L.P. Lee
University of California at Berkeley, USA
- M2A** | **A FUNCTIONAL DISPOSABLE LAB-ON-A-CHIP WITH EMBEDDED MICRO PINCH VALVES FOR WHOLE BLOOD ANALYSIS**
J. Han¹, C. Gao¹, J. Do¹, S.H. Lee¹, J. Kai¹, S. Lee¹, L. Ramasamy¹, J. Nevin¹, G. Beaucage¹, J.Y. Lee², and C.H. Ahn¹
¹University of Cincinnati, USA and ²Ohio State University, USA
- M3A** | **AC ELECTRIC FIELD DRIVEN MICROFLUIDIC CONTROL**
N.G. Green, S.J. Willmore, and H. Morgan
University of Southampton, UK
- M4A** | **PATTERNING BIOLOGICAL SOLUTIONS USING ADDRESSABLE MICROFLUIDIC NETWORKS**
J.-Y. Shiu, C.-W. Kuo, and P. Chen
Academia Sinica, TAIWAN
- M5A** | **CAPILLARY-ASSEMBLED MICROCHIP (CAs-CHIP): ON-CHIP INTEGRATION OF VALVING AND SENSING**
H. Hisamoto, S.-I. Funano, and S. Terabe
University of Hyogo, JAPAN
- M6A** | **CHARACTERIZATION OF AN ELASTOMERIC MICROFLUIDIC ENERGY STORAGE DEVICE**
C. Easley, J. Karlinsey, and J. Landers
University of Virginia, USA
- M7A** | **DESIGN AND VALIDATION OF A COMPLEX GENERIC FLUIDIC MICROPROCESSOR BASED ON EWOD DROPLET FOR BIOLOGICAL APPLICATIONS**
Y. Fouillet, D. Jary, A.G. Brachet, C. Chabrol, J. Boutet, P. Clementz, D. Lauro, R. Charles, and C. Peponnet
CEA, FRANCE

- M8A** | **DEVELOPMENT OF A CHEMICAL-RESISTANT MICROVALVE ARRAY FOR RAPID PARALLEL BIOCHEMICAL SYNTHESIS AND ANALYSIS ON MICROCHIPS**
Z. Hua, Y. Xia, O. Srivannavit, and E. Gulari
University of Michigan, USA
- M9A** | **ELECTROSTATIC ACTUATORS COMPOSED OF EXTENSIBLE GRAPHITE-PDMS COMPOSITE MEMBRANES**
R. Carlson and D. Meldrum
University of Washington, USA
- M10A** | **FLOW PATTERNING BY PHASE-SHIFTED ELECTROSMOTIC FLOWS**
F. Schönfeld¹ and S. Hardt^{1,2}
¹*Institut für Mikrotechnik Mainz GmbH, GERMANY* and
²*Darmstadt University of Technology, GERMANY*
- M11A** | **GENERATION OF LOCAL IN-PLANE MICROVORTEXES ACTUATED BY AC ELECTROSMOSIS**
S.-H. Huang, S.-K. Wang, and F.-G. Tseng
National Tsing Hua University, TAIWAN
- M12A** | **GENERATION OF STEADY FLOW IN SELF-CONTAINED MICROFLUIDIC SYSTEMS**
J. Atencia and D. Beebe
University of Wisconsin at Madison, USA
- M13A** | **MAGNETIC "QUASI-DIGITAL" FLOW REGULATOR FOR DRUG INFUSOR**
M. Duch¹, J. Esteve², A. Salas¹, R. Pérez-Castillejos¹, M.C. Acero¹, J.A. Plaza¹, E. Vallés², and E. Gómez²
¹*Centro Nacional Microelectrónica, SPAIN* and ²*Universitat de Barcelona, SPAIN*
- M14A** | **MICROFLUIDIC MULTI-CHANNEL SYSTEM FOR POLYMERASE CHAIN REACTION WITH INTEGRATED LIQUID HANDLING**
O. Frey, A. Hierlemann, and J. Lichtenberg
ETH Zurich, SWITZERLAND
- M15A** | **MICROPARTICLE MIXING AND SEPARATION BY NONLINEAR ELECTROKINETIC EFFECTS IN MICROFLUIDIC CHANNELS**
C.K. Harnett¹, A.J. Skulan¹, T.F. Hill², L.M. Barrett¹, G.J. Fiechtner¹, and E.B. Cummings¹
¹*Sandia National Laboratories, USA* and
²*Massachusetts Institute of Technology, USA*
- M16A** | **ON-CHIP TUNABLE MICROFLUIDIC DYE LASER**
J.C. Galas¹, J. Torres¹, and Y. Chen^{1,2}
¹*Laboratoire de Photonique et Nanostructures, CNRS, FRANCE* and
²*Ecole Normale Supérieure, FRANCE*
- M17A** | **POLYMER ACTUATORS FOR LIQUID DISPLACEMENT IN MICROCHANNELS**
M. Denoual and B. Lepioufle
SATIE-Biomis, FRANCE
- M18A** | **POLYMER-BASED IN-CHANNEL ACTIVE MICROVALVE OPERATED BY PNEUMATIC/THERMOPNEUMATIC ACTUATION**
D.-K. Yoon, K.-S. Yun, and E. Yoon
Korea Advanced Institute of Science and Technology, KOREA
- M19A** | **POWER-FREE SEQUENTIAL INJECTION FOR MICROCHIP IMMUNOASSAY**
K. Hosokawa, M. Omata, K. Sato, and M. Maeda
RIKEN, JAPAN
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microfluidics - fluid mechanics and modeling

- M20A** | **A SELF-PRIMING HIGH FLOW RATE ULTRASONIC VORTEX PUMP**
X. Chen and A. Lal
Cornell University, USA
- M21A** | **DISPERSION IN MICROCHANNELS: THE IMPORTANCE OF THE WIDTH**
N. Bontoux¹, A. Ajdari², and H.A. Stone³
¹CNRS, FRANCE, ²ESPCI, FRANCE, and ³Harvard University, USA
- M22A** | **EXPANSION CHANNEL FOR MICROCHIP FLOWCYTOMETER**
H. Bang¹, H. Yun¹, K.C. Cho², C. Chung², D.-C. Han¹, and J.K. Chang¹
¹Seoul National University, KOREA and ²Digital Bio Technology, Inc., KOREA
- M23A** | **EXTENDING THE FUNCTIONALITIES OF SHEAR-DRIVEN CHROMATOGRAPHY NANO-CHANNELS USING HIGH ASPECT RATIO ETCHING**
W. De Malsche^{1,2}, D. Clicq¹, H. Eghballi¹, N. Vervoort¹, H. Gardeniers², A. van den Berg², and G. Desmet¹
¹Vrije Universiteit Brussel, BELGIUM and ²University of Twente, THE NETHERLANDS
- M24A** | **THREE-DIMENSIONAL MICROFLUIDIC FLOW FIELD CHARACTERIZATION WITH PARTICAL IMAGE VELOCIMETRY AND LASER SCANNING CONFOCAL MICROSCOPY**
S. Chao, M.R. Holl, L. Jang, and D.R. Meldrum
University of Washington, USA

microfluidics - multi phase fluidics

- M25A** | **A 0.25 PICOLITER ELECTROSTATIC MEMS SIDESHOTTER DROP DISPENSER**
P. Galambos, K. Pohl, D. Luck, and D. Czaplewski
Sandia National Laboratories, USA
- M26A** | **CONTAMINATION-FREE DROPLET FUSION AND CONTINUOUS-FLOW PCR**
M. Chabert, K.D. Dorfman, and J.-L. Viovy
Institut Curie, FRANCE
- M27A** | **DEPENDENCE OF THE NUMBER OF THEORETICAL PLATES OF MICRO COUNTER-CURRENT EXTRACTION ON FLOW RATES**
A. Aota, A. Hibara, and T. Kitamori
University of Tokyo, JAPAN
- M28A** | **DETERMINATION OF MATRIX POLARITY OF TERNARY ORGANIC SOLVENT MIXTURES USING A MICRO SEGMENTED FLOW ASSEMBLY**
P.M. Günther¹, T. Sprogies¹, Th. Frank², J.M. Köhler¹, and G.A. Grob¹
¹Technical University of Ilmenau, GERMANY and ²Little Things Factory, GERMANY
- M29A** | **EFFECTS OF FLUID ELASTICITY ON THE DYNAMICS OF DROP FORMATION IN MICROCHANNEL FLOWS**
J. Husny and J.J. Cooper-White
University of Queensland, AUSTRALIA
- M30A** | **MICROFLUIDIC CHIPS SYSTEMS BASED ON STOPPED-FLOW LIQUID-LIQUID EXTRACTION**
Q. Fang, H. Chen, and Z.-L. Fang
Zhejiang University, CHINA
- M31A** | **MICROTHERMAL TECHNIQUES FOR MIXING, CONCENTRATION, AND HARVESTING OF DNA AND OTHER MICRODROPLET SUSPENSIONS**
A.S. Basu and Y.B. Gianchandani
University of Michigan, USA

microfluidics - world-to-chip interfacing

- M32A** | **A MULTIFUNCTIONAL MACRO-TO-MICRO INTERFACE FOR HIGH THROUGHPUT MICROFLUIDIC SYSTEMS**
I. Meyvantsson and D. Beebe
University of Wisconsin, USA
- M33A** | **FORMATION OF PARALLEL MICROFLUIDIC CHANNELS WITH WEDGE COMPRESSION HIGH-DENSITY FLUIDIC INTERCONNECT TECHNIQUE AND MAGNETIC FORCE SEALING**
L.L. Chu¹ and F. Cerrina²
¹*Genetic Assemblies, Inc., USA* and ²*University of Wisconsin at Madison, USA*
- M34A** | **MICRO-WELL ARRAY INTERFACE FOR CAPILLARY ARRAY ELECTROPHORESIS**
C.R. Forest, B.L. Crane, and I.W. Hunter
Massachusetts Institute of Technology, USA

microfluidics - others

- M35A** | **AN INTEGRATED AND REUSABLE ARRAY PCR GENETIC AMPLIFICATION AND CE DETECTION MICROFLUIDIC CHIP WITH INCORPORATED VALVES**
A.R. Prakash¹, L.M. Pilarski², C.J. Backhouse³, and K.V.I.S. Kaler¹
¹*University of Calgary, CANADA*, ²*Cross Cancer Institute, CANADA*, and ³*University of Alberta, CANADA*
- M36A** | **DEVELOPMENT OF A STABLE CHEMICAL GRADIENT USING A CONVECTION-FREE PLATFORM**
V. Abhyankar and D. Beebe
University of Wisconsin at Madison, USA
- M37A** | **IMAGING SURFACE PLASMON RESONANCE FOR MONITORING BIOMOLECULAR INTERACTIONS IN MICROFLUIDIC DEVICES**
R.B.M. Schasfoort¹, B. Beusink¹, S. Schlautmann¹, A.J. Tüdös¹, and G.H.M. Engbers²
¹*University of Twente, THE NETHERLANDS* and ²*IBIS Technologies B.V., THE NETHERLANDS*

microfabrication - MEMS

- M38B** | **A CHRONIC DRUG-DELIVERY PROBE WITH ON-CHIP CORRUGATED MICROVALVES**
K. Baek, Y. Li, M. Gulari, and K.D. Wise
University of Michigan, USA
- M39B** | **A DEVICE INTEGRATING PARAFFIN MICROACTUATOR, FLUIDIC COMPARTMENT AND MICRONEEDLE ARRAY FOR FLUID INJECTION OR SAMPLING**
H. Yousef¹, M. Lehto¹, T. Jäderblom¹, I. Enculescu^{1,2}, and K. Hjort¹
¹*Uppsala University, SWEDEN* and ²*National Institute of Material Physics, ROMANIA*
- M40B** | **A NOVEL HIGH ENERGY DENSITY DIELECTRIC ELASTOMER ACTUATOR FOR MICRO ANALYSIS SYSTEMS**
J.J. Loverich, I. Kanno, and H. Kotera
Kyoto University, JAPAN
- M41B** | **A SIMPLE TWO TERMINAL LONGITUDINAL HOTWIRE SENSOR FOR MONITORING THE POSITION AND SPEED OF ADVANCING LIQUID FRONTS IN MICRO CHANNELS**
K. Ryu, K. Shaikh, E. Goluch, P. Mathias, and C. Liu
University of Illinois at Urbana-Champaign, USA
- M42B** | **A THREE-DIMENSIONAL SUBSTRATE FOR CARDIAC MYOCYTE ORIENTATION AND CONTRACTION FORCE MEASUREMENTS**
Y. Zhao and X. Zhang
Boston University, USA

M43B | **CONTACTLESS ELECTROCHEMICAL ACTUATOR FOR PRECISE SAMPLING ON MICROCHIP**
L. Metref, F. Herrera, D. Berdat, and M. Gijs
Ecole Polytechnique Fédérale de Lausanne, SWITZERLAND

M44B | **SWITCHABLE STIFFNESS NANOSCANNING PROBE FOR BIOLOGICAL APPLICATIONS**
C. Mueller-Falcke, S. Gouda, S. Kim, and S.-G. Kim
Massachusetts Institute of Technology, USA

microfabrication - micromachining

M45B | **A SHADOW-MASK TO MAKE HALF MILLION SUBMICRON SQUARE PATTERNS AT ONCE**
M.C. Tarhan, A. Tixier-Mita, and H. Fujita
University of Tokyo, JAPAN

M46B | **CONTROLLED OUT-OF-PLANE POSITIONING OF MICROFLUIDIC COMPONENTS IN SU-8 DRIVEN BY PLASTIC STRAIN**
D. Haefliger and A. Boisen
Technical University of Denmark, DENMARK

M47B | **FULLY-DRY FABRICATION OF MONOLITHIC HIGH-ASPECT-RATIO EMBEDDED PARYLENE MICROCHANNELS**
P.-J. Chen, D. Rodger, and Y.-C. Tai
California Institute of Technology, USA

microfabrication - polymer technology

M48B | **MICROFLUIDIC POLYETHER ETHER KETON (PEEK) CHIPS COMBINED WITH CONTACTLESS CONDUCTIVITY DETECTION FOR μ TAS**
H. Mühlberger, A.E. Guber, and W. Hoffmann
Forschungszentrum Karlsruhe, GERMANY

M49B | **FABRICATION OF A HOLLOW METALLIC MICRONEEDLE ARRAY USING SCANNING LASER DIRECT WRITING**
H. Yu¹, K. Shiba¹, B. Li², and X. Zhang¹
¹*Boston University, USA* and
²*Fraunhofer USA Center for Manufacturing Innovation, USA*

M50B | **FABRICATION OF ADDRESSABLE MICROSTRIP AS COMPONENTS FOR THE BIOANALYSIS OR MICROACTUATION**
S.R. Kim, J.Y. Baek, D.J. Kim, G.H. Kwon, and S.H. Lee
Dankook University, KOREA

M51B | **INJECTION MOLDING OF MICROFLUIDIC CHIPS BY EPOXY-BASED MASTER TOOLS**
T. Brenner¹, N. Gottschlich², G. Knebel², C. Mueller¹, H. Reinecke¹, R. Zengerle¹, and J. Dürcke¹
¹*University of Freiburg, GERMANY* and ²*Greiner-Bio One GmbH, GERMANY*

M52B | **PHASE-CHANGING SACRIFICIAL MATERIALS FOR THE FABRICATION OF MICROFLUIDIC ANALYSIS SYSTEMS IN POLYMERS**
R.T. Kelly, P.H. Humble, M.L. Lee, and A.T. Woolley
Brigham Young University, USA

M53B | **SCANNING LASER PRODUCES FUNCTIONAL MICROFLUIDIC STRUCTURES AT A SINGLE SU-8 LAYER**
A. Gueit, A. Sharon, and B. Li
Fraunhofer USA Center for Manufacturing Innovation, USA

M54B | **SURFACE MODIFICATION, MECHANICAL PROPERTY, AND MULTI-LAYER BONDING OF PDMS AND ITS APPLICATION**
O.C. Jeong¹, T. Yamamoto², S.W. Lee², T. Fujii², and S. Konishi¹
¹*Ritsumeikan University, JAPAN* and ²*University of Tokyo, JAPAN*

M55B | **WAFER-SCALE MICROMOLDING OF UNITARY POLYMERIC MICROSTRUCTURES WITH SIMULTANEOUSLY FORMED FUNCTIONAL METAL SURFACE**
X. Wu, Y. Zhao, Y.-K. Yoon, S.-O. Choi, J.-H. Park, and M.G. Allen
Georgia Institute of Technology, USA

microfabrication - others

- M56B** | **A SIMPLE TECHNIQUE FOR INCORPORATING HETEROGENEOUS CATALYSTS INTO MICROREACTORS**
A. Iles¹, R. Wootton², M. Habgood², R. Fortt², and A.J. deMello²
¹National Institute for Materials Science, JAPAN and ²Imperial College London, UK
- M57B** | **LTCC TECHNOLOGY FOR VARIOUS MICROSYSTEM APPLICATIONS**
L. Golonka¹, K. Malecha¹, H. Roguszczyk¹, D. Stadnik², I. Grabowska²,
M. Chudy², A. Dybko², and Z. Brzozka²
¹Wroclaw University of Technology, POLAND and
²Warsaw University of Technology, POLAND

nanotechnology - nanobiotechnology

- M58C** | **AN INTEGRATED MICROFLUIDIC PROCESSOR FOR SINGLE NUCLEOTIDE POLYMORPHISM-BASED DNA COMPUTING**
W.H. Grover and R.A. Mathies
University of California at Berkeley, USA
- M59C** | **FABRICATION OF MICROCANTILEVER WITH NANO-INTERDIGITATED ELECTRODES (IDES) FOR DNA BINDING PROTEIN DETECTION**
J.A. Lee¹, J.Y. Yun¹, K.-C. Lee², S.I. Park², and S.S. Lee¹
¹Korea Advanced Institute of Science and Technology, KOREA and
²Korea Research Institute of Standards and Science, KOREA
- M60C** | **FABRICATION OF MONODISPERSE, SHAPE-SPECIFIC NANOPARTICLES FOR USE AS DELIVERY VECTORS**
G. Denison¹, J. Rolland¹, B. Maynor², L. Euliss², and J.M. DeSimone²
¹Liquidia Technologies, USA and ²University of North Carolina, USA
- M61C** | **FORMATION AND STABILITY OF A SUSPENDED LIPID BILAYER ON SILICON SUBMICRON SIZE PORES**
A. Simon, F. Sauter, C. Pudda, L. Ghenim,
N. Picollet D'hahan, F. Chatelain, and A. Fuchs
CEA, FRANCE
- M62C** | **SELECTIVE FUNCTIONALIZATION OF CANTILEVER, BIOSENSORS USING A MICROARRAY SPOTTER**
K.L. Aubin, S.M. Park, J.M. Moran-Mirabal, B.R. Ilic,
M. Kondratovich, D.M. Lin, and H.G. Craighead
Cornell University, USA
- M63C** | **TEMPERATURE DEPENDENT ANGULAR VELOCITY MEASUREMENT OF F1-ATPASE BIOMOLECULAR MOTOR BY MICRO FABRICATED LOCAL HEATING DEVICE**
H. Arata, H. Noji, and H. Fujita
University of Tokyo, JAPAN

nanotechnology - nanofluidics

- M64C** | **CHEMICAL REACTION BY MIXING IN NANOCHANNEL UTILIZING PRESSURE-DRIVEN FLOW CONTROL SYSTEM**
E. Tamaki¹, A. Hibara², T. Tsukahara², H.B. Kim², and T. Kitamori^{1,2,3}
¹Japan Science and Technology Agency, JAPAN, ²University of Tokyo, JAPAN, and
³Kanagawa Academy of Science and Technology, JAPAN
- M65C** | **HYBRID ATOMISTIC/CONTINUUM MODELING OF ELECTROOSMOTIC FLOW IN NANOSCALE CHANNELS**
R. Nilson and S. Griffiths
Sandia National Laboratories, USA
- M66C** | **EFFICIENT BIOMOLECULE PRE-CONCENTRATION BY NANOFILTER TRIGGERED ELECTROKINETIC TRAPPING**
Y.-C. Wang, C. Tsau, T. Burg, S. Manalis, and J. Han
Massachusetts Institute of Technology, USA

nanotechnology - nanoengineering

- M67C** | **A NANOFUIDIC ELECTROSPRAY SOURCE FABRICATED USING FOCUSED ION BEAM ETCHING**
C. Descatoire¹, D. Troadec¹, L. Buchailot¹, A. Ashcroft², and S. Arscott¹,
¹Institut d'Electronique, de Microélectronique et de Nanotechnologie, FRANCE and
²Astbury Centre for Structural Molecular Biology, UK
- M68C** | **FABRICATION OF SILICA NANOCHANNELS VIA SCANNED COAXIAL ELECTROSPINNING**
M. Wang¹, N. Jing¹, C.-K. Chou², M.-C. Hung², and J. Kameoka¹
¹Texas A&M University, USA and ²University of Texas, USA

materials & surfaces - surface modification

- M69D** | **ADHESION MECHANISMS FOR PHASE SEPARATED POLYMER FILMS USING INTERLOCKING MICROSTRUCTURES AND SURFACE CHEMICAL TREATMENT**
G. Subrebost and G.K. Fedder
Carnegie Mellon University, USA
- M70D** | **ENGINEERING MICROFLUIDIC CHIPS WITH INTEGRATED BINDING SITES FOR ULTRAMINIATURIZED IMMUNOASSAYS**
J.O. Foley, H. Schmid, R. Stutz, and E. Delamarche
IBM Research GmbH, SWITZERLAND
- M71D** | **PROTEIN ADSORPTION RESISTANCE BY BIOCOMPATIBLE PHOSPOLIPID POLYMERS AS A SURFACE MODIFICATION ON PDMS**
K. Ishihara, J. Sibarani, and M. Takai
University of Tokyo, JAPAN
- M72D** | **SUPERHYDROPHOBIC AND HYDROPHILIC STATES ON POROUS SILICON FOR BIOAPPLICATIONS**
A. Ressine, D. Finnskog, G. Marko-Varga, and T. Laurell
Lund University, SWEDEN
- M73D** | **SURFACE MODIFICATION OF PDMS MICROFLUIDIC DEVICES USING TRANSITION METAL SOL-GEL CHEMISTRY**
C.T. Culbertson and G.T. Roman
Kansas State University, USA

materials & surfaces - nanostructured materials

- M74D** | **A METAL-ORGANIC FRAMEWORK BASED PRECONCENTRATOR FOR GAS SAMPLING IN A MICRO-GAS CHROMATOGRAPH**
Z. Ni, M. Shannon, K. Cadwallader, J. Jerrell, and R. Masel
University of Illinois at Urbana-Champaign, USA
- M75D** | **MICROFLUIDIC SURFACE-ENGINEERING OF COLLOIDAL NANOPARTICLES**
S. Khan and K. Jensen
Massachusetts Institute of Technology, USA

materials & surfaces - interface characterization

- M76D** | **A MULTI-TECHNIQUES APPROACH TO THE CHARACTERIZATION OF MICROCHIP SURFACE STATE AND TREATMENTS**
R. Attia, A. Pallandre, B. de Lambert, E. Psichari, and J.-L. Vivoy
Institut Curie, FRANCE

applications - genomics and proteomics

- M77E** **A PLUG-AND-PLAY SINGLE-STEP CAPILLARY ELECTROPHORESIS SYSTEM**
 K. Ono¹ and T. Fujii²
¹Enplas Laboratories, Inc., JAPAN and ²University of Tokyo, JAPAN
- M78E** **HIGH PRECISION PROFILING OF GLYCOPEPTIDES USING HPLC-CHIP/MS TOF**
 K. Killeen¹, H. Yin¹, R. Brennen¹, K. Seaward¹, R. Grimm², X. Li³, H. Zhang³, and R. Aebersold³
¹Agilent Technologies, USA, ²Agilent Technologies, GERMANY, and ³Institute for Systems Biology, USA
- M79E** **HIGH THROUGHPUT COMPACT PROTEIN CRYSTALLIZATION DEVICE**
 M.I. Al-Haq^{1,2}, E. Lebrasseur¹, W.-K. Choi^{1,2}, T. Torii¹, H. Yamazaki², E. Shinohara², and T. Higuchi¹
¹University of Tokyo, JAPAN and ²TechnoMedica Co., Ltd., JAPAN
- M80E** **INCREASED PROTEIN DIGESTION RATE IN POROUS SILICON NANOVIAS ARRAYS**
 D. Finnskog, A. Ressine, G. Marko-Varga, and T. Laurell
 Lund University, SWEDEN
- M81E** **QUANTITATIVE STUDY OF THE ADSORPTION OF PCR REAGENTS DURING ON-CHIP BI-DIRECTIONAL SHUNTING PCR**
 P.-A. Auroux¹, P.J.R. Day², and A. Manz³
¹Imperial College London, UK, ²University of Manchester, UK, and ³ISAS, GERMANY
- M82E** **RADICAL ACTIVATED CLEAVAGE OF PEPTIDES AND PROTEINS: AN ALTERNATIVE TO PROTEOLYTIC DIGESTION**
 B. Jones¹, L. Locascio², and M. Hayes¹
¹Arizona State University, USA and ²National Institute of Standards and Technology, USA

applications - clinical diagnostics

- M83E** **A DISPOSABLE MICROFLUIDIC DEVICE FOR CELL LYSIS AND DNA ISOLATION**
 J. Wang, M. Mauk, Z. Chen, and H.H. Bau
 University of Pennsylvania, USA
- M84E** **A LAB-ON-CHIP FOR RAPID DNA-BASED IDENTIFICATION OF STREPTOCOCCUS PNEUMONIAE**
 B. Fouqué¹, A.-G. Brachet¹, F. Marcel¹, R. Dupont¹, G. Delapierre¹, A. Fischetti², J. Jalava³, and F. Chatelain¹
¹CEA, FRANCE, ²ST Microelectronics, ITALY, and ³Mobidiag, FINLAND
- M85E** **BIONT RESPONSIVE HYDROGELS AS SENSORS IN MICROCHANNELS**
 K. Plunkett¹, J. Moorthy², W. Tepp², K. Berkowski¹, E. Johnson², J. Moore¹, and D. Beebe²
¹University of Illinois at Urbana-Champaign, USA and ²University of Wisconsin at Madison USA
- M86E** **DETECTION OF MUTANT ALLELES IN WILD-TYPE BACKGROUND TOWARDS AN EARLY PANCREATIC CANCER DETECTION**
 S. Ananthnarayan¹, F. McCormick¹, C. Heid², M. Unger², G. Facer², E. Quan², and A. Daridon²
¹University of California at San Francisco, USA and ²Fluidigm Corporation, USA
- M87E** **FOIL-BASED BIOMEMS FOR ELECTROCHEMICAL CAPILLARY IMMUNOASSAYS**
 I. Moser¹, B. Enderle¹, G. Jobst², and G. Urban¹
¹University of Freiburg, GERMANY and ²Jobst Technologies, GERMANY
- M88E** **HIGH SPEED, MULTI-CHANNEL MICROFLUIDIC SYSTEM FOR MULTI-PATHOGENS SEROLOGY MONITORING**
 H. Aoki, Y. Nakamura, M. Tojo, T. Hara, Y. Yamagata, T. Nagamune, and H. Kase
¹Fuence Company, Ltd., JAPAN, ²RIKEN, JAPAN, and ³University of Tokyo, JAPAN
- M89E** **AN INTEGRATED MICRO CELL COUNTING AND CONCENTRATION SENSING CHIP**
 D.W. Lee, S. Yi, and Y.-H. Cho
 Korea Advanced Institute of Science and Technology, KOREA

- M90E** | **ON-CHIP PPT LEVEL ENZYME IMMUNOASSAY OF B-TYPE NATRIURETIC PEPTIDE USING A PDMS BASED MICROFLUIDIC DEVICE COMBINED WITH A PORTABLE SURFACE PLASMON RESONANCE SYSTEM**
 R. Kurita, Y. Sato, F. Mizutani, and O. Niwa
National Institute for Advanced Industrial Science and Technology (AIST), JAPAN
- M91E** | **RAPID BACTERIA COUNTING BY MULTI-STEP BIOCHEMICAL REACTION IN A MICROFLUIDIC DEVICE**
 T. Kogure, T. Matsuno, E. Kawata, K. Noda, M. Sakata, and A. Tokida
Bussan Nanotech Research Institute Inc., JAPAN

applications - microarrays

- M92E** | **CELL ARRAYS ON CHIP**
 M. Zhong, N. Yang, Y.-H. Choi, and D.J. Harrison
University of Alberta, CANADA
- M93E** | **HIGH-THROUGHPUT REAL TIME MEASUREMENTS OF DNA HYBRIDIZATION IN A DOUBLE LAYER POLYDIMETHYLSILOXANE MICROSYSTEM**
 J. Goulpeau^{1,2}, D. Le Clerre³, F. Richard³, L. Talini³,
 D. Trouchet², and P. Tabeling¹
¹ESPCI, FRANCE, ²Bertin Technologies, FRANCE, and ³Genescore, FRANCE
- M94E** | **HIGH-THROUGHPUT SCREENING OF MUTANT AKR ENZYMES USING MRNA DISPLAY AND NOVEL MICROREACTOR ARRAY CHIPS**
 Y. Hosoi¹, K. Takahashi¹, M. Biyani², N. Nemoto³, T. Akagi³, and T. Ichiki^{1,4}
¹University of Tokyo, JAPAN,
²Saitama Small Enterprise Promotion Corporation, JAPAN,
³National Institute for Advanced Industrial Science and Technology (AIST), JAPAN, and
⁴Japan Science and Technology Agency (JST), JAPAN
- M95E** | **INTEGRATED MICROFLUIDIC DEVICE FOR GENE EXPRESSION MICROARRAY**
 R. Liu, T. Nguyen, K. Schwarzkopf, K. Peyvan, and S. Fuji
CombiMatrix Corp., USA
- M96E** | **RAPID CENTRIFUGAL PROCESSING OF MICROARRAY EXPERIMENTS**
 M. Grumann¹, M. Dube², O. Gutmann¹, S. Lutz¹, J. Steigert¹,
 L. Riegger¹, K. Mittmann², M. Daub¹, R. Zengerle¹, and J. Ducreé¹
¹University of Freiburg, GERMANY and
²University of Applied Sciences Münster, GERMANY

applications - separation science

- M97E** | **APPLICATION OF THERMAL LENS MICROSCOPY AND SWEEPING FOR HIGHLY SENSITIVE DETECTION IN ELECTROPHORETIC ANALYSIS ON CYCLOOLEFIN POLYMER MICROCHIPS**
 F. Kitagawa¹, T. Tsuneka¹, Y. Akimoto¹, J. Mizuno², S. Shoji², and K. Otsuka¹
¹Kyoto University, JAPAN and ²Waseda University, JAPAN
- M98E** | **DYNAMIC COATING ON PMMA CE MICROCHIP FOR SIZE-BASED PROTEINS SEPARATION**
 H. Okada¹ and Y. Baba²
¹Nagoya University, JAPAN and
²National Institute for Advanced Industrial Science and Technology (AIST), JAPAN
- M99E** | **EFFECT OF SUB-MICRON PILLAR ARRAY ON DNA KINETICS IN A FREE-SOLUTION CAPILLARY ELECTROPHORESIS MICROSYSTEM**
 Y.C. Chan¹, Y.-K. Lee¹, M. Wong¹, and Y. Zohar²
¹Hong Kong University of Science and Technology, CHINA and
²University of Arizona, USA
- M100E** | **NOVEL MIGRATION PHENOMENA IN STRUCTURED MICROFLUIDIC DEVICES**
 J. Regtmeier, T.T. Duong, R. Eichhorn, D. Anselmetti, P. Reimann, and A. Ros
Bielefeld University, GERMANY
- M101E** | **SINGLE-MASK TECHNOLOGY FOR ON-CHIP HIGH-PRESSURE HPLC SYSTEM**
 C.-Y. Shih and Y.C. Tai
California Institute of Technology, USA

M102E | **TUNABLE PINCHED FLOW FRACTIONATION FOR EFFECTIVE PARTICLE SEPARATION IN MICROFLUIDIC DEVICES**
Y. Sai¹, M. Yamada², M. Yasuda¹, and M. Seki¹
¹Osaka Prefecture University, JAPAN and ²University of Tokyo, JAPAN

M103E | **ULTRASONIC CHROMATOGRAPHY IN SILICON-BASED MICROFLUIDIC SYSTEM**
M.K. Araz and A. Lal
Cornell University, USA

applications - cell handling and analysis

M104E | **A CELL MICRODISPENSER FOR ACCURATE POSITIONING OF SINGLE CELL**
V. Haguët¹, F. Rivera², U. Seger², N. Picollet-D'hahan¹, P. Renaud², and F. Chatelain¹
¹CEA Grenoble, FRANCE and ²EPFL, SWITZERLAND

M105E | **CELL SORTING IN A MICRO-FLUIDIC SYSTEM WITH MAGNETIC NANOPARTICLES**
E. Psychari, A.-E. Saliba, C. Fütterer, M. Slovakova, C. Goubault, and J.-L. Viovy
Curie Institute, FRANCE

M106E | **CONTINUOUS FLOW DIFFUSIVE FILTER FOR APHERESIS OF WHOLE BLOOD**
P. Sethu and M. Toner
Massachusetts General Hospital, Harvard Medical School, and Shriners Burns Hospital, USA

M107E | **CULTURING EMBRYOS ON ENDOMETRIUM TISSUE PREFORMED IN A MICROFLUIDIC DEVICE: A NEW TOOL FOR ART (ASSISTED REPRODUCTIVE TECHNOLOGY)**
S. Ostrovidov^{1,2}, J. Mizuno³, H. Nakamura³, H. Inui³, Y. Sakai¹, and T. Fujii¹
¹University of Tokyo, JAPAN, ²PENTAX Corporation, JAPAN, and ³Inui Institute for Frontier Reproductive Medicine and Infertility, JAPAN

M108E | **STUDY OF BREAST CANCER USING WHOLE CELL IMPEDANCE SPECTROSCOPY**
A. Han¹, L.J. Cruz-Rivera¹, L. Yang² and A.B. Frazier¹
¹Georgia Institute of Technology, USA and ²Emory University, USA

M109E | **ELECTRICAL ASSISTED PATTERNING OF CARDIAC MYOCYTES USING MICROFLUIDIC DEVICE AS A PLATFORM FOR CARDIOVASCULAR ELECTRICAL STIMULATION STUDY**
M. Yang and X. Zhang
Boston University, USA

M110E | **ELECTRONIC SORTING AND RECOVERY OF SINGLE LIVE CELLS FROM MICROLITER SIZED SAMPLES**
A. Fuchs¹, D. Freida¹, M. Abonnenc², G. Medoro², L. Altomare³, A. Romani³, I. van Uiter⁴, M. Tartagni³, R. Guerrieri³, F. Chatelain¹, and N. Manaresi
¹CEA, FRANCE, ²Silicon Biosystems, ITALY, ³University of Bologna, ITALY, and ⁴University of Twente, THE NETHERLANDS

M111E | **EVALUATION OF CELL CYCLE STAGE BY ELECTROPHORETIC MOBILITY USING A MICRO CAPILLARY ELECTROPHORESIS CHIP**
T. Akagi¹, K. Takahashi¹, and T. Ichiki^{1,2}
¹University of Tokyo, JAPAN and ²Japan Science and Technology Agency (JST), JAPAN

M112E | **HIGHLY ADAPTABLE MICROSTRUCTURED 3D CELL CULTURE PLATFORM IN THE 96 WELL FORMAT FOR STEM CELL DIFFERENTIATION AND CHARACTERIZATION**
S. Giselsbrecht¹, R. Truckenmüller¹, A. Welle¹, K.-F. Weibezahn¹, A. Schober², G. Schlingloff², and E. Gottwald¹
¹Forschungszentrum Karlsruhe, GERMANY and ²Technische Universität Ilmenau, GERMANY

M113E | **LARGE SCALE SINGLE CELL ANALYSIS USING HIGH DENSITY HYDRODYNAMIC TRAPPING ARRAYS**
D. Di Carlo, N. Aghdam, P.J. Hung, and L.P. Lee
University of California at Berkeley, USA

- M114E** | **LARGE-SCALE PARAMETRIC STUDY OF ELECTROPORATION IN CANCER CELLS TO CONSTRUCT PHASE DIAGRAMS USING MICRO CELL-ARRAY CHIPS**
H. He, D.C. Chang, and Y.-K. Lee
Hong Kong University of Science and Technology, CHINA
- M115E** | **MEMS DEVICE FOR CONTINUOUS BLOOD CELL SEPARATION**
S. Zheng¹, Y.-C. Tai¹, and H.L. Kasdan²
¹*California Institute of Technology, USA* and ²*IRIS International, Inc., USA*
- M116E** | **MICROFLUIDIC DEVICE WITH INTEGRATED ANTIBODY ARRAYS FOR CELL SIGNALING ANALYSIS**
J. El-Ali¹, S. Gaudet¹, K.P. Murphy, Jr.², U.B. Nielsen², and K.F. Jensen¹
¹*Massachusetts Institute of Technology, USA* and ²*Merrimack Pharmaceuticals Inc., USA*
- M117E** | **MICROFLUIDIC DEVICE FOR ELECTRIC-FIELD DRIVEN SINGLE-CELL CAPTURE AND ACTIVATION**
E.S. Douglas, N.M. Toriello, and R.A. Mathies
University of California at Berkeley, USA
- M118E** | **MICROFUNNELS FOR CHIP-BASED PATCH-CLAMP EXPERIMENTS**
T. Lehnert, D.M.T. Nguyen, L. Baldi, and M.A.M. Gijs
Ecole Polytechnique Fédérale de Lausanne, SWITZERLAND
- M119E** | **MICROFLUIDIC DEVICE FOR THE STUDY OF NEUTROPHIL RESPONSE TO RAPIDLY CHANGING GRADIENTS**
D. Irimia¹, S.-Y. Liu², W. Tharp², A. Samadani³, M. Toner¹, and M. Poznansky¹
¹*Harvard University, USA*, ²*Massachusetts General Hospital, USA*, and ³*Massachusetts Institute of Technology, USA*
- M120E** | **PLANAR NANONEEDLES ON-CHIP FOR INTRACELLULAR MEASUREMENTS**
J. Emmelkamp, J.G.E. Gardeniers, H. Andersson, and A. van den Berg
University of Twente, THE NETHERLANDS
- M121E** | **SINGLE CELL POSITIONING, ENTRAPMENT AND ELECTRICAL CHARACTERISATION**
T. Braschler, R. Johann, U. Seger, P. Linderholm, N. Demierre, and P. Renaud
Swiss Federal Institute of Technology of Lausanne, SWITZERLAND
- M122E** | **TOWARDS SINGLE CELL FINGERPRINTING IN MICROFLUIDIC DEVICE FORMAT: SINGLE CELL MANIPULATION, PROTEIN SEPARATION AND DETECTION**
W. Hellmich, K. Leffhalm, A. Sischka, T. Duong, N. Jensen, K. Niehaus, K. Tönsing, A. Ros, and D. Anselmetti
Bielefeld University, GERMANY
- M123E** | **TRANSISTOR-LESS, MASSIVELY-PARALLEL MANIPULATION OF INDIVIDUAL CELLS BY DIELECTROPHORESIS**
G. Medoro^{1,2}, N. Manaresi¹, M. Tartagni², and R. Guerrieri²
¹*Silicon Biosystems S.r.l., ITALY* and ²*University of Bologna, ITALY*

applications - chemical synthesis

- M124E** | **IONIC LIQUID DROPLET AS MICROREACTOR DISPLACED BY ELECTROWETTING ON DIELECTRIC**
Ph. Dubois^{1,2}, G. Marchand¹, Y. Fouillet¹, C. Peponnet¹, C. Chabrol¹, J. Berthier¹, and M. Vaultier²
¹*CEA, FRANCE* and ²*University of Rennes, FRANCE*
- M125E** | **MASSIVELY PARALLEL OLIGONUCLEOTIDE SYNTHESIS USING MICROMACHINED BEAD-ARRAY MICROWELL PLATE AND LIGHT-DIRECTED CHEMISTRY**
L.L. Chu¹, M.-H. Li², and F. Cerrina³
¹*Genetic Assemblies, Inc., USA*, ²*National University of Singapore, SINGAPORE*, and ³*University of Wisconsin, USA*
- M126E** | **ONLINE MONITORING OF REACTION INTERMEDIATES IN CONTINUOUS FLOW MICROFLUIDIC SYSTEMS**
R. Winkle¹, R. Wootton¹, G. Walter², and A. deMello¹
¹*Imperial College London, UK* and ²*Syngenta, UK*

applications - drug discovery

- M127E** | **A MICROFLUIDIC ARRAY OF PRIMARY MAMMALIAN HEPATOCYTES FOR USE IN HIGH-THROUGHPUT DRUG SCREENING**
B.J. Kane¹, M.J. Zinner¹, M.L. Yarmush^{2,3,4}, and M. Toner^{2,3,4}
¹Brigham and Women's Hospital, USA, ²Massachusetts General Hospital, USA,
³Harvard Medical School, USA, and ⁴Shriners Hospital for Children, USA
- M128E** | **MICROFLUIDIC CELL MIGRATION DEVICE FOR ACCELERATING DRUG DEVELOPMENT IN CANCER METASTASIS**
K.C. Chaw^{1,2}, M. Manimaran¹, and E.H. Tay^{1,2}
¹Institute of Bioengineering and Nanotechnology, SINGAPORE and ²NUS, SINGAPORE

applications - environmental

- M129E** | **HEAVY METAL MEASUREMENT IN MICROFLUIDIC CHANNEL BY CONFINED LIQUID ELECTRODE PLASMA OPTICAL EMISSION SPECTROMETRY**
H. Matsumoto¹, A. Iiduka¹, T. Yamamoto², E. Tamiya¹, and Y. Takamura¹
¹Japan Advanced Institute of Science and Technology (JAIST), JAPAN,
²Tenor Inc., JAPAN, and ³Japan Science and Technology Agency (JST), JAPAN

applications - others

- M130E** | **A MULTICHIP-ARCHITECTURE-BASED FLEXIBLE AND EXTENDIBLE NEURAL STIMULATION DEVICE FOR RETINAL PROSTHESIS**
T. Tokuda¹, A. Uehara^{1,2}, J. Ohta¹, Y. Terasawa², M. Ozawa²,
T. Fujikado³, and Y. Tano³
¹Nara Institute of Science and Technology, JAPAN, ²Nidek Co., Ltd., JAPAN, and
³Osaka University Medical School, JAPAN
- M131E** | **A NEW AUTONOMOUS IMPLANTABLE MICRO POWER SUPPLY USING BONE STRAIN-BASED PIEZOELECTRIC ENERGY HARVESTING**
J.J. Loverich, I. Kanno, and H. Kotera
Kyoto University, JAPAN
- M132E** | **APPLICATION OF MAGNETIC MICROMACHINE FOR MICROPUMP**
S.I. Hisatomi¹, A. Yamazaki¹, K. Ishiyama¹, S. Agatsuma¹, M. Sendoh², and K.I. Arai¹
¹Tohoku University, JAPAN and
²Miyagi Organization for Industry Promotion, JAPAN
- M133E** | **HYDRODYNAMICALLY CONTROLLED DROPLET BREAKUP IN MICROFLUIDIC DEVICES**
S. Doi¹, M. Yamada², M. Yasuda¹, and M. Seki¹
¹Osaka Prefecture University, JAPAN and ²University of Tokyo, JAPAN
- M134E** | **RAISED LATERAL PATCH CLAMP ARRAY IN OPEN-ACCESS FLUIDIC SYSTEM**
A. Lau, P. Hung, and L.P. Lee
University of California at Berkeley, USA
- M135E** | **PREPARATION AND ELECTRICALLY MONITORED MANIPULATION OF GIANT LIPID VESICLES FOR IMPROVED MASS TRANSPORT ON-CHIP**
E.S. Lee, D. Robinson, J.L. Rognlien, C.K. Harnett, B.A. Simmons,
C.R. Bowe Ellis, P.M. Dentinger, C.M. Munoz, and R.V. Davalos
Sandia National Laboratories, USA

detection technologies - optical

- M136F** | **3D INTEGRATION OF MICROLENSSES TO REALIZE A LOW-POWER AND HIGH-SENSITIVITY OPTICAL DETECTION SYSTEM FOR A DISPOSABLE LAB-ON-A-CHIP**
S.-I. Chang and J.-B. Yoon
Korea Advanced Institute of Science and Technology (KAIST), KOREA
- M137F** | **DEVELOPMENT OF UV THERMAL LENS MICROSCOPE (UV-TLM) FOR ULTRASENSITIVE AND DIRECT DETECTION OF NON-LABELED BIOMOLECULES ON A MICROCHIP**
M. Tokeshi¹, S. Hiki², K. Mawatari¹, A. Hlbara³, and T. Kitamori³
¹Kanagawa Academy of Science and Technology, JAPAN,
²Institute of Microchemical Technology, JAPAN, and ³University of Tokyo, JAPAN

- M138F** | **MICROALBUMINURIA DETERMINATION ON A MICROCHIP WITH FLUORESCENCE DETECTION BASED ON THIN-FILM ORGANIC LIGHT EMITTING DIODES**
O. Hofmann¹, X. Wang², J.C. deMello², D.D.C. Bradley², and A.J. deMello²
¹Molecular Vision Ltd., UK and ²Imperial College London, UK
- M139F** | **MICROMACHINED A-Si:H FLUORESCENCE DETECTOR**
T. Kamei¹, M. Nagao¹, and T. Wada²
¹National Institute of Advanced Industrial Science and Technology (AIST), JAPAN and
²Fuji Electric Device Technology Co. Ltd., JAPAN
- M140F** | **PROTEIN BINDING DETECTION IN COMPACT PHOTONIC CRYSTAL MICROCAVITIES**
L. Mirkarimi, E. Chow, D.H. Yang, M.A. Bynum, M. Sigalas, and A. Grot
Agilent Technologies Laboratories, USA
- M141F** | **REFRACTIVE INDEX MEASUREMENT OF SINGLE LIVING CELL USING A BIOPHOTONIC CHIP FOR CANCER DIAGNOSIS APPLICATIONS**
X.J. Liang¹, A.Q. Liu¹, X.M. Zhang¹, P.H. Yap², T.C. Ayi², and H.S. Yoon¹
¹Nanyang Technological University, SINGAPORE and
²DSO National Laboratories, SINGAPORE
- M142F** | **TOWARD ONE MILLION-FOLD SENSITIVITY ENHANCEMENT BY SWEEPING IN CAPILLARY ELECTROPHORESIS COMBINED WITH THERMAL LENS MICROSCOPIC DETECTION USING AN INTERFACE CHIP**
T. Tsuneka¹, K. Sueyoshi¹, K. Uchiyama², A. Hattori², F. Kitagawa¹, and K. Otsuka¹
¹Kyoto University, JAPAN and ²Nippon Sheet Glass Co., LTD., JAPAN

detection technologies - electrochemical

- M143F** | **METHOD OF CALIBRATION OF GLUCOSE SENSOR IMPLEMENTED IN AN INTEGRATED MICRODIALYSIS BASED SYSTEM**
D. Pijanowska¹, A. Sprenkels², W. Olthuis², and P. Bergveld²
¹Polish Academy of Sciences, POLAND and
²MESA+ University of Twente, THE NETHERLANDS
- M144F** | **SUB-µm SPACED NANO-POROUS ELECTRODE SYSTEMS: FABRICATION, PROPERTIES, AND APPLICATION TO SENSITIVE ELECTROCHEMICAL DETECTION**
U. Müller¹, J. Kentsch¹, W. Nisch¹, S. Neugebauer², W. Schuhmann², S. Linke³, M. Kaczor³, T. Lohmueller⁴, J. Spatz⁴, and M. Stelzle¹
¹Universität Tübingen, GERMANY,
²Ruhr-University of Bochum, GERMANY,
³HL Planartechnik GmbH, GERMANY, and
⁴University of Heidelberg, GERMANY

detection technologies - mass spectrometry

- M145F** | **A FULLY INTEGRATED PLASMA ELECTRON SOURCE FOR MICRO MASS SPECTROMETERS**
J.-P. Hauschild, E. Wapelhorst, J. Müller, and M. Doms
Hamburg University of Technology, GERMANY
- M146F** | **THE RAPID ANALYSIS OF SMALL MOLECULES AND DRUG SCREENING FROM DESORPTION / IONIZATION MASS SPECTROMETRY ON NANOPORE MATERIALS**
C.-S. Lee¹, K.-K. Kang², H.-K. Rhee², and B.-G. Kim²
¹Chungnam National University, KOREA and
²Seoul National University, KOREA

detection technologies - others

- M147F** | **A WATER-BASED CHEMICAL MONITORING SYSTEM USING INTEGRATED SILICON-IN-PLASTIC MICROFABRICATION**
 L. Zhu¹, D. Meier², C. Montgomery², S. Semancik², and D. DeVoe¹
¹University of Maryland, USA and
²National Institute of Standards and Technology, USA
- M148F** | **INVESTIGATION OF A RAPID MICROFLUIDIC SURFACE PLASMON RESONANCE IMAGING (SPRI) SIGNAL AMPLIFICATION SCHEME BASED ON THE RATE OF FORMATION OF AN ENZYME-CATALYZED PRECIPITATE**
 M.S. Hasenbank, E. Fu, and P. Yager
 University of Washington, USA
- M149F** | **MICROMACHINED SCINTILLATION DEVICES WITH CHARGE CONVERSION NANOPARTICLES FOR NEUTRON AND BETA PARTICLE DETECTION**
 R.K. Dasaka, S.M. Pellegrin, M. Kamavaram, and C.G. Wilson
 Louisiana Technical University, USA

SALON F/G

Session 1A3
Electrokinetic Separation
 Session Chair:
 J. Landers, University of Virginia

SALON E

Session 1B3
Droplet
 Session Chair:
 M. Seki, Osaka Prefecture University

4:30 PM - 4:50 PM
ZONE SCULPTING WITH PARTITIONED ELECTROKINETIC INJECTIONS

T.M. Squires¹, M. Narovlyansky²,
 and G.M. Whitesides²
¹Caltech, USA and ²Harvard Chemistry, USA

MOVING NON-CONDUCTIVE AND CONDUCTIVE DROPLETS IN A PARALLEL PLATE ARRAY

D. Chatterjee, B. Hetayothin, A.R. Wheeler,
 D.J. King, and R.L. Garrell
 University of California at Los Angeles, USA

4:50 PM - 5:10 PM
ORDERED NANOPORE CAVITY ARRAY STRUCTURED BY COLLOIDAL TEMPLATING FOR ELECTROPHORESIS OF LARGE DNA MOLECULES

Y. Zeng and D.J. Harrison
 University of Alberta, CANADA

USING CARTRIDGES OF NANOLITER PLUGS FOR HIGH THROUGHPUT SCREENING

J.Q. Boedicker, B. Zheng, L. Li,
 D. Chen, and R.F. Ismagilov
 University of Chicago, USA

5:10 PM - 5:30 PM
1.5 DIMENSIONAL ELECTROPHORESIS IN NANOSCALE CHANNELS

S. Pennathur and J.G. Santiago
 Stanford University, USA

TIMING CONTROLLABLE ELECTROFUSION OF DROPLETS IN A MICROFLUIDIC DEVICE

W.H. Tan and S. Takeuchi
 University of Tokyo, JAPAN

5:30 p.m.

| Adjourn for the day



● Tuesday, October 11, 2005

8:30 a.m. - 9:10 a.m.

Plenary IIIChair: **T. Laurell**, *Lund Institute of Technology***MICROFABRICATION, MICROFLUIDICS, AND BIOMEDICINE: NEW TOOLS AND NEW OPPORTUNITIES**G.M. Whitesides
*Harvard University, USA***SALON F/G****Session 2A1**

Cell Manipulation

Session Chair:

A. Ricco, *Stanford University***SALON E****Session 2B1**

Nano Channel Fabrication

Session Chair:

H. Craighead, *Cornell University*

9:15 AM - 9:35 AM

NANONEWTON FORCES APPLIED TO CELLULAR ADHESIONS WITH MAGNETIC NANOWIRES IN AN ELASTOMERIC MICRONEEDLE ARRAYN.J. Sniadecki¹, A. Angelouch², J.L. Tan², D.H. Reich², and C.S. Chen²¹*University of Pennsylvania, USA* and²*Johns Hopkins University, USA***NANOIMPRINTING OF NANOFUIDIC CHANNELS BY USING HYDROPHILIC HYDROGEN SILSESQUIOXANE (HSQ)**L.-J. Cheng, S.-T. Chang, and L.J. Guo
University of Michigan, USA

9:35 AM - 9:55 AM

HYDRODYNAMIC TWEEZERS: SINGLE-CELL TRAPPING ARRAYS FOR CELL DYNAMICSB.R. Lutz and D.R. Meldrum
*University of Washington, USA***DNA MOLECULAR ISOLATION IN NANO CHANNEL FOR SINGLE MOLECULE TRAPPING BETWEEN MICRO ELECTRODES**M. Kumemura¹, K. Tamura¹, G. Hashiguchi², and H. Fujita¹¹*University of Tokyo, JAPAN* and²*Kagawa University, JAPAN*

9:55 AM - 10:15 AM

ACOUSTIC TRAPPING OF CELLS IN A MICROFLUIDIC FORMATM. Nilsson¹, L. Johansson², T. Lilliehorn², M. Lindvall¹, J. Piskur¹, M. Almqvist¹,S. Johansson², T. Laurell¹, and J. Nilsson¹¹*Lund University, SWEDEN* and²*Uppsala University, SWEDEN***RAPIDLY-PROTOTYPED 3D NANOFUIDICS IN GLASS**

S.H. Lee, K. Ke, A.J. Hunt, and E.F. Hasselbrink, Jr.

University of Michigan, USA

10:15 a.m. - 10:45 a.m. | Break

SALON F/G**Session 2A2**

Integrated Cell Culture / Analysis Systems

Session Chair:

H. Lu, *Georgia Institute of Technology***SALON E****Session 2B2**

MicroFabrication

Session Chair:

T. Fujii, *University of Tokyo*

10:45 AM - 11:05 AM

INTEGRATED SYSTEM TO ANALYZE THE GENETIC EFFECTS OF THE SPACE ENVIRONMENT ON LIVING CELLS IN CULTURE: GENESATA.J. Ricco¹, E. Agasid², V. Barker², T. Fahlen², J.W. Hines², L. Levine³, R. Mancinelli², D. Oswell¹, R. Ricks², K. Ronzano², D. Squires², C. Storment¹, G. Swais², L. Timucin², U. Udoh¹, and B. Yost²¹*Stanford University, USA,*²*NASA Ames Research Center, USA, and*³*ALine, Inc., USA***AN INTEGRATED BIOPHOTONIC AND MICROFLUIDIC CHIP FOR CD4 CELL SORTING APPLICATIONS**Y. Sun¹, A.Q. Liu¹, P.H. Yap², and T.C. Ayi²¹*Nanyang Technological University, SINGAPORE* and²*DSO National Laboratories, SINGAPORE*

11:05 AM - 11:25 AM
LOGARITHMICALLY PERFUSED EMBRYONIC STEM CELL CULTURE ON CHIP

 L.Y. Kim, H.-Y. Lee, and J. Voldman
Massachusetts Institute of Technology, USA
ASSEMBLY AND PRINTING OF MICRO AND NANO OBJECTS

 T. Kraus^{1,2}, L. Malaquin¹, E. Delamarche¹,
 H. Schmid¹, N.D. Spencer², and H. Wolf¹
¹IBM Research GmbH, SWITZERLAND and
²Swiss Federal Institute of Technology ETH
 Zurich, SWITZERLAND

11:25 AM - 11:45 AM
DYNAMIC PROFILING OF HEPATOCYTE STRESS RESPONSE IN A MICROFLUIDIC MULTI-CLONE LIVING CELL ARRAY

 K.R. King¹, S. Wang^{2,3}, D. Irimia^{2,3},
 M. Yarmush^{2,3}, A. Jayaraman^{2,3},
 and M. Toner^{1,2,3}
¹Harvard-MIT Health Science and
 Technology, USA, ²Harvard Medical School,
 USA, and ³Shriners Hospital for Children, USA

POROUS SILICON DIOXIDE CHANNELS FABRICATED FROM BLACK SILICON FOR ELECTROKINETIC SEPARATION DEVICES

 K.B. Mogensen, R.C. de A. Costa,
 and J.P. Kutter
Technical University of Denmark, DENMARK

11:45 a.m. - 1:30 p.m.

Grab 'n Go Lunch

1:30 p.m. - 2:10 p.m.

Plenary IV
 Chair: **L. Locascio, NIST**
CONTROLLING INTERNAL ORGANIZATION AND DIVISION AXIS OF CULTURED CELLS WITH ADHESIVE MICROPATTERNS

 M. Théry¹, A. Pépin², Y. Chen², and M. Bornens¹
¹Institut Curie, FRANCE and
²Laboratoire Photonique et Nanostructures, FRANCE

2:15 p.m. - 4:30 p.m.

Poster Session 2 (floorplan on page 60)
microfluidics - fluid manipulation

- | | |
|------------|---|
| T1A | A GAS ACTUATED MICRO-JET PUMP FOR MICROFLUIDIC SYSTEMS
X.H. Li ¹ , X. Yu ¹ , H. Cui ¹ , Z. Li ² , and D. Zhang ¹
¹ Peking University, CHINA and
² Institute of Mechanics Chinese Academy Sciences, CHINA |
| T2A | A PHASE CHANGE MICROVALVE USING A MELTABLE MAGNETIC MATERIAL: FERRO-WAX
K.W. Oh, K. Namkoong, and C. Park
<i>Samsung Advanced Institute of Technology, KOREA</i> |
| T3A | A REAGENT INJECTION SYSTEM FOR STIMULATION TO SPECIFIC CELL COLONIES USING 3-D SHEATH FLOW SCANNER
H. Mikado ¹ , M. Kanai ² , H. Nakanishi ² , and S. Shoji ¹
¹ Waseda University, JAPAN and ² Shimadzu Corporation, JAPAN |
| T4A | AC ELECTROKINETIC MICROPUMPS: THE EFFECT OF GEOMETRICAL CONFINEMENT, FARADAIC CURRENTS, AND NONLINEAR SURFACE CAPACITANCE
L. Olesen ^{1,2} , H. Bruus ² , and A. Ajdari ¹
¹ Ecole Supérieure de Physique et de Chimie Industrielles, FRANCE and
² Technical University of Denmark, DENMARK |
| T5A | CONTROL OF PARTICLE-DEPOSITION PATTERN IN A SESSILE DROPLET BY USING THE RADIAL ELECTROOSMOTIC FLOW
S.J. Kim ^{1,2} , K.H. Kang ³ , J.G. Lee ² , I.S. Kang ¹ , and B.J. Yoon ¹
¹ Pohang University of Science and Technology, KOREA,
² Samsung Advanced Institute of Technology, KOREA, and
³ University of Toronto, CANADA |
| T6A | COPLANAR DIGITAL MICROFLUIDICS USING STANDARD PRINTED CIRCUIT BOARD PROCESSES
P. Paik ¹ , V. Pamula ² , M.G. Pollack ² , and K. Chakrabarty ¹
¹ Duke University, USA and ² Advanced Liquid Logic, Inc., USA |

- T7A** | **ELECTROSMOTIC PUMPING THROUGH NANOCHANNELS**
D. Kim¹, J.Y. Min², S.J. Kim², and E.S. Yoon¹
¹*Korea Institute of Machinery and Materials, KOREA* and
²*Korea Advanced Institute of Science and Technology, KOREA*
- T8A** | **HIGHLY-INTEGRATED MICROFLUIDIC CONTROL ON MICRO OPTICAL SWITCHING VALVES ASSEMBLED DISK**
H. Nagai, T. Irie, and S. Wakida
National Institute for Advanced Industrial Science and Technology (AIST), JAPAN
- T9A** | **IMPROVED DESIGN AND PERFORMANCE OF AN ACOUSTICALLY OPERATED MULTI CHANNEL PARTICLE SEPARATION CHIP**
A. Nilsson, F. Petersson, and T. Laurell
Lund University, SWEDEN
- T10A** | **LOCALLY CONTROLLING THE ENVIRONMENT OF A MICROFLUIDIC CHIP AND PROGRAMMING ITS FLOW RATES**
M. Zimmermann^{1,2}, S. Bentley¹, D. Juncker¹, H. Schmid¹, P. Hunziker², and E. Delamarche¹
¹*Zürich Research GmbH, SWITZERLAND* and
²*University Hospital Basel, SWITZERLAND*
- T11A** | **MICRO FLUIDICS & INDUCED-CHARGE ELECTROKINETIC FLOWS**
F. Schönfeld¹ and S. Hardt^{1,2}
¹*Institut für Mikrotechnik Mainz GmbH, GERMANY* and
²*Darmstadt University of Technology, GERMANY*
- T12A** | **MICROFLUIDIC CHIP FOR MASS SPECTROMETRIC ANALYSIS OF MULTIPLE BIOCHEMICAL REACTIONS**
S.-H. Lee¹, C.-S. Lee², B.-G. Kim¹, and Y.-K. Kim¹
¹*Seoul National University, KOREA* and ²*Chungnam National University, KOREA*
- T13A** | **MICROPUMPING USING THIN HYBRID BIOPOLYMER MEMBRANE**
J.Y. Park¹, I.C. Kim², J.M. Cha¹, J.H. Lee², and B.K. Kim¹
¹*Korea Institute of Science and Technology, KOREA* and
²*Seoul National University, KOREA*
- T14A** | **OPTICALLY DRIVEN MICROPUMP PRODUCED BY TWO-PHOTON MICROSTEREOLITHOGRAPHY**
S. Maruo and H. Inoue
Yokohama National University, JAPAN
- T15A** | **PERFLUOROPOLYETHERS AS NOVEL MATERIALS FOR SOLVENT RESISTANT MICROFLUIDIC DEVICES**
J.P. Rolland¹, G.M. Denison¹, and J.M. DeSimone²
¹*Liquidia Technologies, Inc., USA* and
²*University of North Carolina at Chapel Hill, USA*
- T16A** | **PROGRAMMING OF CAPILLARY EFFECTS FOR LIQUID CONFINEMENT AND AUTOMATIC FLOW CONTROL IN MICROFLUIDIC PROBES**
D. Juncker^{1,2}, H. Schmid¹, and E. Delamarche¹
¹*IBM Research GmbH, SWITZERLAND* and
²*ETH Zurich, SWITZERLAND*
- T17A** | **SAW LAB-ON-CHIP IN VIEW OF PROTEIN AFFINITY PURIFICATION IMPLEMENTED FROM NANODROPLET TRANSPORT**
A. Renaudin¹, K. Chuda², V. Zhang¹, X. Coqueret², J.-C. Camart¹, P. Tabourier¹, and C. Druon¹
¹*IEMN, FRANCE* and ²*LCOM, FRANCE*
- T18A** | **SLIDING QUANTITATIVE NANOLITER DISPENSING DEVICE FOR MULTIPLE ANALYSIS**
M. Kuwata¹, K. Sakamoto¹, Y. Murakami¹, K. Morishima¹, H. Sudo², M. Kitaoka¹, and T. Kitamori³
¹*The Research Association of Micro Chemical Process Technology, JAPAN*,
²*Toshiba Corporation, JAPAN*, and ³*University of Tokyo, JAPAN*
- T19A** | **THEORETICAL ANALYSIS AND MICROFABRICATION OF AN ALL-IN-CHANNEL CHEMICAL GRADIENT GENERATOR FOR CHEMOTAXIS ASSAYS**
D. Irimia^{1,3}, D.A. Geba², and M. Toner^{1,3}
¹*Massachusetts General Hospital, USA*,
²*University of California at Berkeley, USA*, and ³*Harvard Medical School, USA*

microfluidics - fluid mechanics and modeling

- T20A** | **AN INTEGRATED, HIGH FLOW RATE MEMS FERROFLUID PUMP**
L. Mao and H. Koser
Yale University, USA
- T21A** | **COMPLEX FLUIDS RHEOLOGY IN MICROCHANNELS USING A MICRO-PIV TECHNIQUE**
G. Degré¹, P. Joseph¹, H. Willaime¹, P. Tabeling¹,
S. Lerouge², M. Cloitre³, J.-B. Fournier¹, and A. Ajdari¹
¹ESPCI, FRANCE, ²MSC, FRANCE, and ³MMC, FRANCE
- T22A** | **MEASUREMENT OF NANO PARTICLE CONCENTRATION NEAR SURFACE IN MICRO CHANNEL**
K. Kanda and M. Yang
Tokyo Metropolitan University, JAPAN
- T23A** | **MILLION-FOLD SAMPLE STACKING USING ON-CHIP ISOTACHOPHORESIS**
B. Jung¹, H. Lin¹, R. Bharadwaj¹, B. Mohammadi², and J.G. Santiago¹
¹Stanford University, USA and ²University of Montpellier II, FRANCE
- T24A** | **QUANTITATIVE VELOCITY MEASUREMENTS OF LAMBDA-DNA TRANSPORT IN MICRODEVICES**
S. Gulati, S.J. Muller, and D. Liepmann
University of California at Berkeley, USA

microfluidics - multi phase fluidics

- T25A** | **A MICROFLUIDIC SENSOR FOR INTERFACIAL TENSION MEASUREMENT**
N.T. Nguyen, S. Lassemono, F.A. Chollet, and C. Yang
Nanyang Technological University, SINGAPORE
- T26A** | **BOTH INTERNAL AND EXTERNAL FLOW FIELDS MEASUREMENTS IN AND AROUND A MICRO-DROPLET FORMED IN A MICROCHANNEL**
S.Y. Yoon¹, J.M. Kim², and K.C. Kim¹
¹Pusan National University, KOREA and ²LG Electronics, Inc., KOREA
- T27A** | **CONFOCAL MICRO-PIV MEASUREMENT OF INTERNAL FLOW IN A MOVING DROPLET**
H. Kinoshita, M. Oshima, S. Kaneda, and T. Fujii
University of Tokyo, JAPAN
- T28A** | **GAS-LIQUID CROSSING FLOW INSIDE A MICROCHANNEL**
H. Hachiya^{1,2}, M. Tokeshi³, M. Kitaoka¹, and T. Kitamori^{3,4}
¹The Research Association of Micro Chemical Process Technology, JAPAN,
²DKK-TOA Corporation, JAPAN,
³Kanagawa Academy of Science and Technology, JAPAN, and
⁴University of Tokyo, JAPAN
- T29A** | **MONODISPERSE DROPLET TRAINS AND SEGMENTED FLOW FOR CENTRIFUGAL MICROFLUIDICS**
S. Haeberle, R. Zengerle, and J. Ducreé
University of Freiburg, GERMANY
- T30A** | **NUMERICAL ANALYSIS OF MICRO DROPLET GENERATION USING A PARTICLE METHOD**
T. Harada¹, Y. Suzuki², S. Koshizuka¹, T. Arakawa³, and S. Shoji³
¹University of Tokyo, JAPAN,
²Japan Science and Technology Agency, JAPAN, and
³Waseda University, JAPAN

microfluidics - world-to-chip interfacing

- T31A** | **ELECTRICAL AND FLUIDIC INTERFACE OF A POLYMERIC MICROFLUIDIC DEVICE WITH PRINTED CIRCUIT BOARD**
M. Mueller^{1,2}, M. Khine^{1,2}, C. Ionescu-Zanetti¹, N. Patel¹, J. Seo¹, and L.P. Lee¹
¹University of California at Berkeley, USA and
²University of California at San Francisco, USA
- T32A** | **INTEGRATED CHIP AND PACKAGE DESIGN FOR SURFACE-CONTROLLED BIOREACTION PROCESSES WITH ROBUST, REUSABLE FLUIDIC SEALING**
J.J. Park, T.M. Valentine, R. Ghodssi, and G.W. Rubloff
University of Maryland, USA
- T33A** | **USER-FRIENDLY ONE TOUCH LOCK AND DETACHABLE MICROFLUIDIC CONNECTOR**
K. Morishima^{1,2}, Y. Kikutani^{2,3}, M. Kitaoka², and T. Kitamori^{2,4}
¹Tokyo University of Agriculture and Technology, JAPAN,
²Kanagawa Academy of Science and Technology, JAPAN,
³The Research Association of Micro Chemical Process Technology, JAPAN, and
⁴University of Tokyo, JAPAN

microfluidics - others

- T34A** | **MULTI-CHANNEL MICROFLUIDIC IMMUNOASSAY CHIP FOR SIMULTANEOUS MULTIPLE ANALYTE DETECTION USING ELECTROSPRAY DEPOSITION METHOD**
Y. Yamagata¹, A. Tajima², T. Nagamune², H. Aoki³, H. Kase³, S. Hoshina⁴, I. Kondo⁴, and H. Ohmori¹
¹RIKEN, JAPAN, ²University of Tokyo, JAPAN, ³Fuence Co. Ltd., JAPAN, and
⁴Jikei University School of Medicine, JAPAN
- T35A** | **STATIONARY CHEMICAL GRADIENT REACTORS IN THE SEARCH FOR ARTIFICIAL CELLS**
J.S. McCaskill¹, S. Ehses², S. Chemnitz¹, U. Tangen¹, T. Maeke¹, M. Jünger¹, T. Palutke², and P.F. Wagler²
¹Ruhr-Universität-Bochum, GERMANY and ²Fraunhofer Gesellschaft, GERMANY
- T36A** | **TEMPERATURE CONTROL OF MICROFLUIDIC SYSTEMS BY MICROWAVE HEATING**
S.G. Sundaresan¹, B.J. Polk², D.R. Reyes², M.V. Rao¹, and M. Gaitan²
¹George Mason University, USA and
²National Institute of Standards and Technology, USA

microfabrication - MEMS

- T37B** | **A MICRO-POST PRECONCENTRATOR FOR A MICROSCALE GAS CHROMATOGRAPHY SYSTEM**
Y. Tang, J. Yeom, J. Han, B. Bae, R.I. Masel, and M.A. Shannon
University of Illinois at Urbana-Champaign USA
- T38B** | **FABRICATION OF THREE DIMENSIONAL MICROCHANNELS IN SU8**
A. Gracias, B. Xu, and J. Castracane
University at Albany - SUNY, USA
- T39B** | **FLUID-STRUCTURE TRAVELING WAVE FILTERS BASED ON THE MAMMALIAN COCHLEA**
R.D. White and K. Grosh
University of Michigan, USA
- T40B** | **HIV DIAGNOSTICS FOR RESOURCE-LIMITED SETTINGS USING MEMS BASED TECHNIQUES**
U. Demirci^{1,2,3}, M. Dixon², D. Irimia^{1,2,3}, X. Cheng^{1,2,3}, L. Zamir², W.R. Rodriguez², and M. Toner^{1,2,3}
¹Harvard Medical School, USA, ²Massachusetts General Hospital, USA, and
³Shriners Burns Institute, USA
- T41B** | **NOVEL MATERIAL PATTERNING FOR ELECTRONIC AND MAGNETIC COMPONENTS ON PDMS**
R. Carlson, J. Koschwanez, and D. Meldrum
University of Washington, USA

microfabrication - micromachining

- T42B** | **A NEW NEURAL RECORDING ELECTRODE ARRAY WITH PARYLENE INSULATING LAYER**
C. Pang, J.G. Cham, Z. Nenadic, Y.-C. Tai, J.W. Burdick, and R.A. Andersen
California Institute of Technology, USA
- T43B** | **FABRICATION AND CHARACTERIZATION OF PLANAR NANOFUIDIC CHANNELS AND MASSIVELY-PARALLEL VERTICAL NANOFUIDIC MEMBRANES**
P. Mao and J. Han
Massachusetts Institute of Technology, USA
- T44B** | **FABRICATION OF MICROPIPETTE CHIPS FOR SIMULTANEOUS ELECTROPHYSIOLOGICAL AND OPTICAL MEASUREMENTS**
A. Minamino¹, K. Takahashi¹, T. Akagi¹, and T. Ichiki^{1,2}
¹*University of Tokyo, JAPAN* and
²*Japan Science and Technology Agency (JST), JAPAN*

microfabrication - polymer technology

- T45B** | **A COLLAPSE-FREE THERMAL BONDING TECHNIQUE FOR PLASTIC MICROFLUIDIC SYSTEMS WITH LARGE AREA MICROCHAMBERS**
D.S. Kim¹, H.S. Lee¹, T.H. Kwon¹, and C.H. Ahn²
¹*Pohang University of Science and Technology, KOREA* and
²*University of Cincinnati, USA*
- T46B** | **CHARACTERIZATION OF A NEW GENERIC 3D POLYMER TECHNOLOGY FOR MICROTAS**
P. Abgrall¹, K. Chuda², X. Coqueret², and A.M. Gué¹
¹*LAAS/CNRS, FRANCE* and ²*LCOM, FRANCE*
- T47B** | **CONSTRUCTION OF INTEGRATED MICRO- AND NANOFUIDIC SYSTEMS: APPLICATION OF PHOTOPOLYMERIZATIONS AND BLOCK COPOLYMER SELF ASSEMBLY**
J.B. Hutchison, K.P. Brazhnik, and L.E. Locascio
National Institute of Standards and Technology, USA
- T48B** | **FACILE FABRICATION OF MICROFLUIDIC SYSTEMS USING ELECTRON BEAM LITHOGRAPHY**
P. Mali, A. Sarkar, and R. Lal
Indian Institute of Technology Bombay, INDIA
- T49B** | **EMBEDDING MICROSCALE METAL PATTERNS IN POLYDIMETHYLSILOXANE SUBSTRATE**
K.S. Lim^{1,2}, W.-J. Chang², Y.-M. Koo^{1,2}, and R. Bashir¹
¹*Weldon School of Biomedical Engineering, USA* and ²*Inha University, KOREA*
- T50B** | **POLYMER REPLICATED INTERDIGITATED ELECTRODE ARRAYS AND THEIR APPLICATION IN MULTIPARAMETER MOLECULAR DIAGNOSTICS**
P. Jacobs¹, G. Van Reybroeck¹, J. Suls², W. Layreyn²,
C. Van Hoof², P. Detemple³, and R. Rossau¹
¹*Innogenetics N.V., BELGIUM*, ²*IMEC Vzw., BELGIUM*, and ³*IMM, GmbH, GERMANY*
- T51B** | **POLYMERIC ENCAPSULATION OF LIQUID USING MICROFLUIDIC DEVICE AND "ON THE FLY" PHOTOPOLYMERIZATION**
H.J. Oh, S.H. Kim, D.J. Kim, G.H. Kwon, and S.H. Lee
Dankook University, KOREA
- T52B** | **SCALABILITY OF INSULATOR-BASED DIELECTROPHORESIS (IDEP) AND ITS UTILIZATION AS A HIGH-THROUGHPUT PARTICLE CONCENTRATOR AND SEPARATOR**
G.J. McGraw, R.V. Davalos, B.M. Mittal, S.M. Ferko, M.C. Hunter, J.D. Brazzle,
Y. Fintschenko, E.B. Cummings, and B.A. Simmons
Sandia National Laboratories, USA

microfabrication - others

- T53B** | **COFIRE CERAMIC MICRODEVICES FOR HIGH TEMPERATURE AND HIGH PRESSURE APPLICATIONS**
K.D. Patel, K.W. Hukari, and K.A. Peterson
Sandia National Laboratories, USA

nanotechnology - nanobiotechnology

- T54C** | **AMPLIFIED SINGLE MOLECULE DETECTION IN A THERMOPLASTIC MICROFLUIDIC SYSTEM**
J. Jarvius, J. Melin, J. Göransson, H. Johansson, F. Nikolajeff, U. Landegren, and M. Nilsson
Uppsala University, SWEDEN
- T55C** | **COMPLETE EXTENSION OF CHROMOSOMAL DNA AND ITS MANIPULATION USING OPTICALLY-DRIVEN MICRO-FABRICATED HOOKS**
K. Terao¹, H. Kabata², H. Oana¹, and M. Washizu¹
¹*University of Tokyo, JAPAN* and ²*Kyoto University, JAPAN*
- T56C** | **SPECTRAL AND MOBILITY MEASUREMENTS OF SINGLE FLUORESCENT NANOBARCODES IN SUBMICROMETER FLUIDIC CHANNELS**
S. Stavis, J. Edel, Y. Li, K. Samiee, D. Luo, and H.G. Craighead
Cornell University, USA
- T57C** | **DNA SAMPLE PREPARATION FOR STM/STS BY NANOLITHOGRAPHY**
S. Horiike, Y. Oikawa, and T. Nishimoto
Shimadzu Corporation, JAPAN
- T58C** | **FABRICATION OF CUSTOMIZED BIOACTIVATED NANOPORE DEVICES**
A.H. Talasaz, D. Pantelis, M. Ronaghi, F. Pease, and R.W. Davis
Stanford University, USA
- T59C** | **MANIPULATION OF COILED DNA MOLECULES BY FORMATION AND LASER TRAP OF THERMOREVERSIBLE HYDROGEL**
F. Arai, K. Yoshikawa, A. Ichikawa, H. Maruyama, and T. Fukuda
Nagoya University, JAPAN

nanotechnology - nanofluidics

- T60C** | **SIMPLE AND QUICK DETECTION OF TARGET DNA BY HYBRIDIZATION IN NANO GAP CHANNEL ARRAY**
S. Hashioka, R. Ogawa, A. Oki, Y. Miyahara, and Y. Horiike
National Institute for Materials Science, JAPAN
- T61C** | **SIMULATION OF ELECTROKINETIC TRANSPORT IN SILICA NANOCHANNELS**
S. Joseph, A.N. Chatterjee, and N.R. Aluru
University of Illinois at Urbana-Champaign, USA
- T62C** | **WATER VISCOSITY AND HYDRODYNAMIC FLOW IN NANOPILLAR CHIPS**
N. Kaji¹, A. Oki², R. Ogawa², Y. Horiike², and Y. Baba^{1,3}
¹*Nagoya University, JAPAN,*
²*National Institute for Materials Science, JAPAN,* and
³*National Institute of Advanced Industrial Science and Technology, JAPAN*

nanotechnology - nanoengineering

- T63C** | **CONTROLLABLE NANO-GAP MECHANISM FOR CHARACTERIZATION OF NANO-SCALE OBJECTS**
M. Gel¹, T. Edura², Y. Wada², and H. Fujita¹
¹University of Tokyo, JAPAN and ²Waseda University, JAPAN
- T64C** | **MAPPING THE LIGHT EMERGING FROM NANOSCALE APERTURES**
S.C. Jacobson, N.D. Rawlinson, D. Amarie, M.L. Kovarik, W.L. Schaich, and B. Dragnea
Indiana University, USA

materials & surfaces - surface modification

- T65D** | **A SIMPLE HYDROPHILIC TREATMENT OF SU-8 SURFACES FOR CELL CULTURING AND CELL PATTERNING**
Z. Wang, M. Stangegaard, M. Dufva, J.P. Kutter, and A. Wolff
Technical University of Denmark, DENMARK
- T66D** | **EFFECT OF SURFACTANTS ON ELECTROSMOTIC FLOW AND TRAPPING BEHAVIOR IN A POLYMERIC INSULATOR-BASED DIELECTROPHORETIC (iDEP) DEVICE**
G.J. McGraw, K. Lee Krafcik, T.I. Wallow, M.C. Hunter, A.M. Morales, R.V. Davalos, Y. Fintschenko, E.B. Cummings, and B.A. Simmons
Sandia National Laboratories, USA
- T67D** | **ELECTROPHORETIC PROTEIN SEPARATION USING ELECTROSMOTIC FLOW INDUCED BY DYNAMIC SDS-COATING OF PLASTIC CHIPS**
H. Nagata¹, M. Tabuchi², K. Hirano¹, Y. Baba^{1,2,3}, and M. Ishikawa¹
¹National Institute of Advanced Industrial Science and Technology (AIST), JAPAN, ²University of Tokushima, JAPAN, and ³Nagoya University, JAPAN
- T68D** | **INTEGRATED CIRCUIT AND MICRO-FABRICATION COMPATIBLE MATERIALS FOR PROTEIN BINDING**
M. Anwar¹, T. Aytur², J. Foley², P.R. Beatty², and B. Boser²
¹Massachusetts Institute of Technology, USA and ²University of California at Berkeley, USA
- T69D** | **LOCAL SURFACE MODIFICATION OF MICROCHANNEL BY ACCUMULATING AND MELTING FUNCTIONAL POLYMER PARTICLES**
N. Nonaka¹, M. Yamamoto¹, M. Yamada², M. Yasuda¹, and M. Seki¹
¹Osaka Prefecture University, JAPAN and ²University of Tokyo, JAPAN
- T70D** | **PERMANENTLY HYDROPHILIC PDMS SUBSTRATES BY ELECTROSTATIC SELF ASSEMBLY AND CHEMICAL CROSSLINKING**
H. Makamba, Y.-Y. Hsieh, W.-C. Sung, and S.-H. Chen
National Cheng Kung University, TAIWAN
- T71D** | **PHOTOLITHOGRAPHIC PATTERNING OF MULTI-PROTEINS ON A SINGLE CHIP USING LOW-MELTING-POINT AGAROSE AS A PROTECTION LAYER**
L.M. Lee, R.L. Heimark, J.C. Baygents, and Y. Zohar
University of Arizona, USA

materials & surfaces - nanostructured materials

- T72D** | **FABRICATION OF NANOSTRUCTURES OF POLY (ETHYLENE GLYCOL) AND ITS APPLICATIONS TO PROTEIN ADSORPTION AND CELL ADHESION**
P. Kim¹, D.-H. Kim², B. Kim², S.-K. Choi³, S.H. Lee³, A. Khademhosseini⁴, R. Langer⁴, and K.Y. Suh¹
¹Seoul National University, KOREA, ²Korea Institute of Science and Technology (KIST), KOREA, ³Korea University, KOREA, and ⁴Massachusetts Institute of Technology, USA
- T73D** | **PROTON CONDUCTING NANOPOROUS SILICON MEMBRANES FOR ON-CHIP MINIATURE FUEL CELL APPLICATIONS**
K.-L. Chu, R. Subramanian, M.A. Shannon, and R.I. Masel
University of Illinois at Urbana-Champaign, USA

materials & surfaces - interface characterization

- T74D** | **THERMALLY INDUCED PHASE TRANSITIONS OF BIOMOLECULES OBSERVED VIA NANOMECHANICAL MOTION FROM MICROCANTILEVERS**
 S. Biswal¹, D.A. Raorane¹, A. Chaiken², H. Birecki², S. Naberhuis², and A. Majumdar¹
¹University of California at Berkeley, USA and ²HP Labs, USA

applications - genomics and proteomics

- T75E** | **A NEW SELF-SPOTTING ARRAY FOR MULTI-ANALYTE IMMUNOASSAY PROTEIN LAB-ON-A-CHIP ON CYCLIC-OLEFIN COPOLYMER (COC)**
 J. Kai and C.H. Ahn
 University of Cincinnati, USA
- T76E** | **FLOW-BASED DETECTION OF BAR CODED PARTICLES**
 K.A. Rose¹, G. Dougherty², and J.G. Santiago¹
¹Stanford University, USA and ²Lawrence Livermore National Laboratory, USA
- T77E** | **DIGITAL MICROFLUIDICS BASED METHOD FOR PROTEOMICS**
 A.R. Wheeler, C.A. Bird, D. Chatterjee, H. Moon, R.R.O. Loo, C.-J. Kim, J.A. Loo, and R.L. Garrell
 University of California at Los Angeles, USA
- T78E** | **IMAGING OF HEAT DENATURATION OF SINGLE DNA MOLECULES IN FEMTOLITER CHAMBERS ON A MICRO HEATING DEVICE: TOWARD A SINGLE-MOLECULE DETECTION OF PCR**
 K. Ishizuka¹, H. Arata², S. Sakakihara³, C. Bergaud², K.V. Tabata³, Y. Rondelez², S. Takeuchi², H. Fujita², and H. Noji³
¹Tokyo Institute of Technology, JAPAN, ²University of Tokyo, JAPAN, and ³Osaka University, JAPAN
- T79E** | **NANORAINBOW IN INTEGRATED MICROFLUIDICS FOR MULTIPLEXED LABEL-FREE GENOMIC STUDIES**
 G.L. Liu¹, E.H. Anderson², J.A. Liddle², and L.P. Lee¹
¹University of California at Berkeley, USA and ²Lawrence Berkeley National Laboratory, USA

applications - clinical diagnostics

- T80E** | **A DISPOSABLE MICROFLUIDIC POINT-OF-CARE DEVICE FOR THE DETECTION OF HIV: A NEW UP-CONVERTING PHOSPHOR TECHNOLOGY APPLICATION**
 Z. Chen¹, P.L.A.M. Corstjens², M. Zuiderwijk², J. Wang¹, M.G. Mauk¹, H.H. Bau¹, W.R. Abrams¹, and D. Malamud¹
¹University of Pennsylvania, USA and ²Leiden University Medical Center, THE NETHERLANDS
- T81E** | **A FULLY INTEGRATED MICRODEVICE FOR CLINICAL ANALYSIS**
 J.P. Ferrance, J. Bienvenue, L. Legendre, C. Easley, J. Karlinsey, M.G. Roper, and J.P. Landers
 University of Virginia, USA
- T82E** | **BUBBLE-FREE PRIMING OF BLIND CAPILLARIES FOR HIGH ACCURACY CENTRIFUGAL HEMATOCRIT MEASUREMENTS**
 L. Riegger, M. Grumann, T. Brefka, J. Steigert, C.P. Steinert, T. Brenner, R. Zengerle, and J. Dührée
 University of Freiburg, GERMANY
- T83E** | **FEMTO MOLAR DETECTION OF A PROSTATE-SPECIFIC ANTIGEN (PSA) USING A DYNAMIC SELF-EXCITING NANOMECHANICAL CANTILEVER**
 J.H. Lee, K.S. Hwang, G.Y. Han, K.Y. Choi, D.S. Yoon, and T.S. Kim
 Korea Institute of Science and Technology, KOREA

- T84E** | **IN SITU INTERFACIAL FABRICATION OF AN ENZYMATICALLY CLEAVABLE MEMBRANE**
 D. Kim¹, J. Moorthy¹, N.O.L. Viernes², J.S. Moore², and D.J. Beebe¹
¹University of Wisconsin, USA and ²University of Illinois at Urbana-Champaign, USA
- T85E** | **LFDI PREPROCESSING: AN ENABLING TECHNOLOGY FOR IR CLINICAL ANALYSIS AND DIAGNOSTICS**
 C. Mansfield, A. Man, and R.A. Shaw
 National Research Council of Canada, CANADA
- T86E** | **MULTIPLEX CHEMILUMINESCENCE ASSAY ON "BEAD-ARRAY", PROBES ON BEADS ARRAYED IN A MICROCHANNEL**
 Y. Kohara¹, H. Noda¹, T. Kobayashi², and K. Suto²
¹Hitachi Ltd., JAPAN and ²Hitachi Chemical Co. & Ltd., JAPAN
- T87E** | **ON-CHIP BLOOD SAMPLE PREPARATION FOR SUBSEQUENT PCR**
 D. Dadic, F. Doffing, M. Herrmann, G. Münchow, and K.S. Drese
 Institut für Mikrotechnik Mainz GmbH, GERMANY
- T88E** | **ON-CHIP PCR WITH ELECTROCHEMICAL DETECTION FOR CLINICAL DIAGNOSIS**
 N. Elejalde¹, R.W. Keay², S.E. Flower², A.T.A. Jenkins², G. Edwards³, L.M. Peter², J. Clarkson², and J.M. Cooper¹
¹University of Glasgow, UK, ²University of Bath, UK, and ³Stobhill Hospital, UK

applications - microarrays

- T89E** | **A COMPACT SYSTEM FOR MULTIPLEX IMMUNOASSAY USING BIO-FUNCTIONALIZED OPTICALLY CODED NANORODS**
 S. Pannu¹, K. Rose², J.B.-H. Tok¹, S. Penn³, M. Sha³, and G.M. Dougherty¹
¹Lawrence Livermore National Laboratory, USA, ²Stanford University, USA, and ³Nanoplex Technologies, Inc., USA
- T90E** | **INTEGRATION OF DNA MICROARRAY ON PDMS WITH A MICRO FABRICATED SU-8 PCR CHIP TO DETECT CAMPYLOBACTER**
 H. Głason¹, A. Sekulovic¹, T.B. Christensen¹, S. Bouaidat¹, C. Berendsen², D.D. Bang³, and A. Wolff¹
¹Technical University of Denmark, DENMARK, ²Scandinavian Micro Biodevices, DENMARK, and ³Danish Food and Veterinary Services, DENMARK
- T91E** | **MICROFLUIDIC MICROARRAY ASSEMBLY AND ITS APPLICATIONS TO MULTI-SAMPLE DNA HYBRIDIZATION**
 X.Y. Peng^{1,2}, P.C.H. Li¹, L. Wang¹, H.-Z. Yu¹, A.M. Parameswaran¹, and W.L. Chou¹
¹Simon Fraser University, CANADA and ²Xiamen University, CHINA
- T92E** | **REPRODUCIBLE POROUS SILICON PROTEIN MICROARRAYS -CHIP MANUFACTURING AND APPLICATION TO CLINICAL BIOMARKERS**
 A. Ressine¹, D. Finnskog¹, J. Malm², C. Becker², H. Lilja², G. Marko-Varga¹, and T. Laurell¹
¹Lund University, SWEDEN and ²University Hospital, SWEDEN

applications - separation science

- T93E** | **A DIRECT MEASUREMENT OF THE TRAPPING TIME OF LAMBDA DNA AT AN ENTROPIC BARRIER**
 J. Cross, K. Samiee, and H.G. Craighead
 Cornell University, USA
- T94E** | **CAPILLARY AND MICROCHIP BASED SOLID-PHASE EXTRACTION WITH AN ENTRAPPED BEAD COLUMN**
 R. Xie and R. Oleschuk
 Queen's University, CANADA
- T95E** | **ENRICHMENT OF PROTEIN USING MICROFABRICATED SILICON MICRO-PILLAR ARRAY STRUCTURES**
 K.D Liu, Z.Q. Zou, G.S. Zhuang, Q.H. Jin, J.L. Zhao, and M.S. Yang
 Chinese Academy of Sciences, CHINA

- T96E IMPROVING LIQUID CHROMATOGRAPHY EFFICIENCY: CHANNELS STRUCTURED WITH MICRO-PILLARS**
M. De Pra¹, W.T. Kok¹, J.G.E. Gardeniers², G. Desmet³, and P.J. Schoenmakers¹
¹University of Amsterdam, THE NETHERLANDS,
²University of Twente, THE NETHERLANDS, and
³Vrije Universiteit Brussel, BELGIUM
- T97E NUMERICAL SIMULATION OF ELECTROKINETIC FORCE FIELDS FOR PARTICLE MANIPULATION AND SORTING IN A BRANCHED-U-TURN 2D-LIKE NANOFUIDIC DEVICE**
G.O.F. Parikesit, A.P. Markesteijn, O. Piciu, V.G. Kutchoukov, J. Westerweel, A. Bossche, Y. Garini, and I.T. Young
Delft University of Technology, THE NETHERLANDS
- T98E ON-LINE SAMPLE PRECONCENTRATION USING A WATER PLUG ON MICROCHIP WITH T-CROSS CHANNEL CONFIGURATION FOR HIGHLY SENSITIVE ELECTROPHORETIC ANALYSIS**
K. Sueyoshi¹, H. Nagai², S. Wakida², J. Nishii², F. Kitagawa¹, and K. Otsuka¹
¹Kyoto University, JAPAN and
²National Institute of Advanced Industrial Science and Technology, JAPAN
- T99E SELF-REGULATED I-SHAPED MICROCHANNELS FOR SIMULTANEOUS ELECTROPHORESIS**
A. Inoue^{1,2}, T. Ito¹, K. Sato¹, K. Hosokawa¹, K. Makino², and M. Maeda¹
¹RIKEN, JAPAN and ²Tokyo University of Science, JAPAN
- T100E TOWARDS TWO-PHASE ELECTROPHORESIS IN MICROCHANNELS**
G. Muenchow¹, K.S. Drese¹, J.P. Kutter², and S. Hardt^{1,3}
¹Institut für Mikrotechnik Mainz GmbH, GERMANY,
²Technical University of Denmark, DENMARK and
³Darmstadt University of Technology, GERMANY

applications - cell handling and analysis

- T101E 3D PERFUSED LIVER MICROREACTOR ARRAY IN THE MULTIWELL CELL CULTURE PLATE FORMAT**
K. Domansky, W. Inman, J. Serdy, and L.G. Griffith
Massachusetts Institute of Technology, USA
- T102E A LOW-VOLTAGE SINGLE CELL ELECTROPORATION ARRAY**
M. Khine¹, A. Lau¹, C.-I. Zanetti¹, J. Seo¹, E.S. Lee², R.V. Davalos², and L.P. Lee¹
¹University of California at Berkeley, USA and ²Sandia National Laboratories, USA
- T103E A NEW CELL COUNTING AND SORTING SYSTEM USING MICRO-PUMPS/VALVES FOR MULTI-WAVELENGTH DETECTION APPLICATIONS**
C.M. Chang, S.K. Hsiung, and G.B. Lee
National Cheng Kung University, TAIWAN
- T104E A PARALLEL ANALYSIS AND SORTING CHIP FOR SINGLE CELL STUDY**
H. Yu¹, B. Li², A. Sharon², and X. Zhang¹
¹Boston University, USA and
²Fraunhofer USA Center for Manufacturing Innovation, USA
- T105E A SCALABLE ROW/COLUMN-ADDRESSABLE DIELECTROPHORETIC CELL-TRAPPING ARRAY**
B. Taff and J. Voldman
Massachusetts Institute of Technology, USA
- T106E ADHESION-BASED CELL VELOCITY REGULATION IN AN ANTIBODY-COATED MICRO COLUMN FOR STEM CELL SEPARATION**
J. Miwa, Y. Suzuki, and N. Kasagi
University of Tokyo, JAPAN
- T107E CHARACTERIZATION OF PASSIVE VISCOELASTIC PROPERTIES OF SINGLE CELLS WITH PDMS MICROPOST ARRAYS**
M.T. Yang, N.J. Sniadecki, and C.S. Chen
University of Pennsylvania, USA
- T108E CIRCULATING TUMOR CELL CAPTURE FROM WHOLE BLOOD BY PARYLENE FILTER DEVICES**
S. Zheng¹, Y.-C. Tai¹, H. Lin², M. Balic², R. Datar², and R.J. Cote²
¹California Institute of Technology, USA and
²University of Southern California, USA

- T109E** | **CONFOCAL RESTRICTED-HEIGHT IMAGING OF SUSPENSION CELLS (CRISC) IN A PDMS MICRODEVICE DURING APOPTOSIS**
C. Munoz-Pinedo¹, S. Le Gac, D.R. Green¹, and A. van den Berg²
¹LIAI, USA and ²University of Twente, THE NETHERLANDS
- T110E** | **CONTINUOUS SINGLE CELL LYSIS WITH INTEGRATED SEPARATION OF CELL CONTENT**
C.R. Poulsen and J.M. Ramsey
University of North Carolina, USA
- T111E** | **DEVELOPMENT OF A MICRO BREEDER SYSTEM FOR IN VITRO PRODUCTION OF BLASTOCYSTS**
K. Sato¹, K. Sato¹, M. Ozawa², K. Kikuchi², T. Nagai³, and T. Kitamori¹
¹University of Tokyo, JAPAN,
²National Institute of Agrobiological Sciences, JAPAN, and
³National Institute of Livestock and Grassland, JAPAN
- T112E** | **FABRICATION OF MULTI-PHENOTYPE CELL ARRAYS WITHIN REVERSIBLY SEALED MICROFLUIDIC CHANNELS FOR HIGH-THROUGHPUT ANALYSIS**
A. Khademhosseini¹, G. Eng¹, J. Yeh¹, J. Karp¹,
H. Kaji², J. Borenstein³, O. Farokhzad⁴, and R. Langer¹
¹Massachusetts Institute of Technology, USA,
²Tohoku University, JAPAN, ³Draper Laboratory, USA, and
⁴Brigham and Women's Hospital, USA
- T113E** | **INVESTIGATION OF DETRIMENTAL EFFECT OF MECHANICAL STRESSES ON PULMONARY EPITHELIAL CELLS DURING AIRWAY REOPENING USING COMPARTMENTALIZED IN VITRO MICROFLUIDIC CULTURE OF PRIMARY SMALL AIRWAY EPITHELIAL CELLS**
D. Huh, H. Fujioka, J.B. Grotberg, and S. Takayama
University of Michigan, USA
- T114E** | **MICROFLUIDIC DEVICE FOR THE RAPID MEASUREMENT OF THE INHERENT FLUORESCENCE AND IMPEDANCE PROPERTIES OF INDIVIDUAL MARINE ALGAE**
D. Holmes, G. Benazzi, M. Mowlem, and H. Morgan
University of Southampton, UK
- T115E** | **MICROFABRICATED STACKS OF ARRAYED BIOLOGICAL SAMPLES**
H. Johansson, J. Jarvius, J. Melin, M. Nilsson, and U. Landegren
Uppsala University, SWEDEN
- T116E** | **A MICROPERFUSION SYSTEM FOR IMPROVED VIABILITY IN THICK SLICE PREPARATIONS OF BRAIN TISSUE**
M. McClain, M. LaPlaca, and A.B. Frazier
Georgia Institute of Technology, USA
- T117E** | **MICROINSTRUMENTS FOR SINGLE CELLULAR STUDIES**
S. Yang and T. Saif
University of Illinois at Urbana-Champaign, USA
- T118E** | **MICROPARTICLE MANIPULATION AND CELL HANDLING ON OPTICAL WAVEGUIDES**
S. Gaugiran¹, G. Colas¹, A. Fuchs¹, S. Getin¹, and J. Dérouard²
¹CEA, FRANCE and ²UJF, FRANCE
- T119E** | **ON-CHIP NON-INVASIVE VOLTAGE CLAMP ON XENOPUS OOCYTES**
E. Dahan¹, V. Bize², T. Lehnert¹, J.-D. Horisberger², and M.A.M. Gijs¹
¹EPFL, SWITZERLAND and ²University of Lausanne, SWITZERLAND
- T120E** | **SIMULATION OF MULTIPLE OPERATION MODES OF A JET CELL SORTER**
C.C. Chen¹, G.W. Auner¹, and O. Solgaard¹
¹Wayne State University, USA and ²Stanford University, USA
- T121E** | **SINGLE CELL PROFILING USING MORPHOMETRIC AND PERMEABILITY DATA: BEHAVIOR IN A CONTROLLED MICROENVIRONMENT**
C. Ionescu-Zanetti¹, D. Di Carlo¹, L.-P. Wang¹, A. Di Blas², and L.P. Lee¹
¹University of California at Berkeley, USA and
²University of California at Santa Cruz, USA
- T122E** | **THREE DIMENSIONAL ASYMMETRIC MICROENVIRONMENT FOR CELL BIOLOGICAL STUDIES**
T. Frisk, S. Rydholm, H. Andersson, H. Brismar, and G. Stemme
Royal Institute of Technology, SWEDEN

applications - chemical synthesis

- T123E** | **GENERATION OF DYE-DOPED POLYMER AND COMPOSITE NANOPARTICLES BY USE OF CHIP REACTORS**
P.M. Günther, J. Wagner, G.A. Groß, and J.M. Köhler
Technical University of Ilmenau, GERMANY
- T124E** | **HIGH-TEMPERATURE MICROFLUIDIC SYNTHESIS OF SEMICONDUCTOR NANOCRYSTALS IN NANOLITER DROPLETS**
E.M. Chan¹, A.P. Alivisatos^{1,2}, and R.A. Mathies¹
¹*University of California at Berkeley, USA* and
²*Lawrence Berkeley National Laboratory, USA*
- T125E** | **IMPROVED MULTI-PHASE ENZYMATIC SYNTHESIS IN A MICROCHANNEL**
K. Koch¹, R.J.F. van den Berg¹, P.J. Nieuwland¹, M. Ueno², T. Kitamori², F.P.J.T. Rutjes¹, and J.C.M. Van Hest¹
¹*Radboud University Nijmegen, THE NETHERLANDS* and
²*University of Tokyo, JAPAN*
- T126E** | **KINETIC STUDY OF AN ON-CHIP ISOCYANATE DERIVATIZATION REACTION BY ON-LINE NANO-ESI MS**
M. Brivio, A. Liesner, R.E. Oosterbroek, W. Verboom, U. Karst, A. van den Berg, and D.N. Reinhoudt
MESA+ University of Twente, THE NETHERLANDS

applications - drug discovery

- T127E** | **CELL CULTURE AND RESPONSE ASSAY TOTAL SYSTEM FOR PROTEIN SECRETION ON A MICROCHIP**
T. Nishino¹, T. Manabu², M. Kitahara¹, and T. Kitamori³
¹*Nissan Chemical Industries, Ltd., JAPAN*,
²*Kanagawa Academy of Science and Technology, JAPAN*, and
³*University of Tokyo, JAPAN*
- T128E** | **SELF-FORMING LATERAL APERTURES IN SILICON MICROCHANNELS FOR PATCH CLAMPING**
L. Yobas¹, L. Zhao², J. Zhu³, R.S. Kumar¹, R. Nagarajan¹, S.S.I. Liw¹, W.C. Hui¹, T.M. Lim², and F.S. Sheu²
¹*Institute of Microelectronics, SINGAPORE*,
²*National University of Singapore, SINGAPORE*, and
³*Nanyang Technological University, SINGAPORE*
- T129E** | **TOWARDS MOLECULAR SCREENING: RAPID HIGH-SENSITIVITY ANALYSIS AND ELECTROPORATION OF LIPOSOME MICROREACTORS**
P.S. Dittrich and A. Manz
Institute for Analytical Sciences, GERMANY

applications - environmental

- T130E** | **MICROSCALE GLUCOSE BIOFUEL CELL WITH METALLIC CATALYST ON CATHODE**
N.S. Korivi and J.-W. Choi
Louisiana State University, USA

applications - others

- T131E** | **A COMPLETELY AUTOMATED CELL-PRETREATMENT UNIT FOR PROTEOMICS AND A NOVEL COATING REAGENT FOR MICROSTRUCTURES**
M. Tabuchi¹, F. Tomita², N. Hagiwara², H. Nagata³, K. Kobayashi², S. Miki², K. Arai², T. Ishiguro², and Y. Baba^{3,4}
¹*University of Tokushima, JAPAN*, ²*Taiyo Yuden Co., Ltd, JAPAN*,
³*National Institute for Advanced Industrial Science and Technology (AIST), JAPAN*, and
⁴*Nagoya University, JAPAN*
- T132E** | **BULK TITANIUM MICROFLUIDIC NETWORKS FOR PROTEIN SELF-ASSEMBLY STUDIES**
E.R. Parker, L.S. Hirst, C.R. Safinya, and N.C. MacDonald
University of California at Santa Barbara, USA

- T133E** | **DEPOSITION AND PATTERNING OF THIN-FILM MATERIALS ON CURVED SURFACES USING MICROFLUIDIC METHODS**
E. Goluch, K. Shaikh, K. Ryu, J. Chen, J. Engel, and C. Liu
University of Illinois at Urbana-Champaign, USA
- T134E** | **LIPID BILAYER FORMATION BY CONTACTING MONOLAYERS**
K. Funakoshi, H. Suzuki, and S. Takeuchi
University of Tokyo, JAPAN
- T135E** | **MICROSYSTEMS TO STUDY INTERACTIONS BETWEEN PLANT ROOTS AND THE ROOT ZONE**
C.-S. Kim and D.M. Porterfield
University of Missouri at Rolla, USA

detection technologies - optical

- T136F** | **AN INTEGRATED SURFACE PLASMON RESONANCE WAVEGUIDE DEVICE FOR IMMUNO-SENSOR**
C.-W. Lin¹, C.-L. Lee¹, J.-G. Huang¹, S.-S. Lee¹, C.-H. Wang¹
L.-J. Yang², Y.-J. Yang¹, P.-Z. Chang¹, W.-S. Wang¹, and C.-K. Lee¹
¹National Taiwan University, TAIWAN and ²Tamkang University, TAIWAN
- T137F** | **BI-DIRECTIONAL OPTICAL FLOW SENSOR FOR ONLINE MICROFLUIDIC MONITORING**
Z. Yang¹, S. Matsumoto², J. Tsaur², N. Ichikawa², and R. Maeda²
¹Tokyo Metropolitan Industrial Research Institute, JAPAN and
²National Institute of Advanced Industrial Science and Technology (AIST), JAPAN
- T138F** | **BIOMOLECULE DETECTION WITH INTEGRATED PHOTONIC CRYSTAL FIBER SENSOR**
L. Rindorf¹, P.E. Hoiby², J.B. Jensen¹, L.H. Pedersen²,
T.P. Hansen³, O. Bang¹, and O. Geschke¹
¹Technical University of Denmark, DENMARK, ²Bioneer A/S, DENMARK, and
³Crystal Fibre A/S, DENMARK,
- T139F** | **DEVELOPMENT OF HYBRID DETECTION SYSTEM FOR SIMULTANEOUS DETECTION OF THERMAL LENS AND FLUORESCENCE SIGNALS**
J. Yamaguchi¹, T. Fukuzawa¹, A. Hattori¹, M. Tokeshi², and T. Kitamori³
¹Nippon Sheet Glass Co., Ltd., JAPAN,
²Institute of Microchemical Technology, JAPAN, and ³University of Tokyo, JAPAN
- T140F** | **DEVELOPMENT OF NOVEL NON-CONTACT AND IN-SITU MICROFLOW SENSOR USING FLOWING THERMAL LENS**
Y. Kikutani^{1,2}, K. Mawatari^{1,2}, M. Tokeshi^{2,3}, T. Fukuzawa^{3,4},
M. Kitaoka¹, and T. Kitamori^{1,2,3,5}
¹The Research Association of Micro Chemical Process Technology, JAPAN,
²Kanagawa Academy of Science and Technology, JAPAN,
³Institute of Microchemical Technology, JAPAN,
⁴Nippon Sheet Glass Co., Ltd., JAPAN, and ⁵University of Tokyo, JAPAN
- T141F** | **GEOMETRICAL EFFECT OF GOLD NANOPARTICLES ON ENHANCED SENSITIVITY OF SURFACE PLASMON RESONANCE IMAGING**
T. Kang, S. Hong, S.K. Kang, J. Moon, S. Oh, and J. Yi
Seoul National University, KOREA
- T142F** | **POLYMER-BASED WAVEGUIDE SURFACE PLASMON RESONANCE SENSOR FABRICATED BY A REPLICA-MOLDING PROCESS**
J. Kishimoto¹, T. Nishikawa¹, T. Matsushita¹, H. Yamashita¹,
M. Nakamura¹, T. Wazawa², and S. Aoyama¹
¹OMRON Corporation, JAPAN and ²Osaka University, JAPAN

detection technologies - electrochemical

- T143F** | **ANALYSIS OF FLUIDIC BEAD CUBE EMBEDDED PORTABLE CMOS SENSING SYSTEM FOR IMMUNO REACTION MONITORING**
Y.W. Jeong¹, K. Choi¹, S. Park¹, J. Kim¹, D.S. Chung¹,
B.K. Kim², H.C. Kim¹, and K. Chun¹
¹Seoul National University, KOREA and
²Korea Institute of Science and Technology (KIST), KOREA

detection technologies - mass spectrometry

- T144F** | **FABRICATION AND OPTIMIZATION OF ENCLOSED SU-8 TIP STRUCTURES FOR ELECTROSPRAY IONIZATION MASS SPECTROMETRY**
S. Tuomikoski¹, T. Sikanen², R. Ketola², R. Kostiainen², T. Kotiaho², and S. Franssila¹
¹Helsinki University of Technology, FINLAND and ²University of Helsinki, FINLAND
- T145F** | **AERODYNAMIC FOCUSING FOR TIPLESS ELECTROSPRAY INTERFACING**
F. Foret, J. Grym, M. Otevreil, and M. Spesny
Institute of Analytical Chemistry, CZECH REPUBLIC

detection technologies - others

- T146F** | **A MICRO DIFFERENTIAL VISCOSITY DETECTOR FOR POLYMER SEPARATION SYSTEMS**
M. Blom¹, R. Van 't Oeveř¹, P. Claes², S. O'Donohue², and A. van den Berg³
¹Micronit Microfluidics BV, THE NETHERLANDS,
²Polymer Laboratories Ltd., UK, and
³MESA+ University of Twentes, THE NETHERLANDS
- T147F** | **APPLICATIONS OF X-RAY FLUORESCENCE ANALYSIS FOR CHEMICAL MICROCHIPS**
K. Tsuji^{1,2}, T. Emoto¹, Y. Nishida¹, K. Tsutsumimoto¹, K. Nakano¹, E. Tamaki³, Y. Kikutani⁴, A. Hibara^{2,3}, and T. Kitamori^{3,4}
¹Osaka City University, JAPAN, ²JST-PRESTO, JAPAN,
³University of Tokyo, JAPAN, and
⁴Korea Advanced Institute of Science and Technology (KAIST), JAPAN
- T148F** | **DETECTION OF PROTEIN CONFORMATIONAL CHANGES USING MECHANO-CHEMICAL SENSOR**
K. Mogami¹, Y. Yamagata², and H. Kase¹
¹Fuence Company, Ltd., JAPAN and ²RIKEN, JAPAN



SALON F/G

Session 2A3
DNA & Protein Detection

Session Chair:

M. Toner, *Massachusetts Institute of Technology*

SALON E

Session 2B3
DNA Analysis

Session Chair:

A. Manz, *ISAS-Institute for Analytical Sciences*

4:30 PM - 4:50 PM

RAPID AND SENSITIVE SINGLE-BASE MISMATCH DETECTION BY A POWER-FREE PDMS MICROCHIP WITH SURFACE PLASMON RESONANCE IMAGING

Y. Sato, K. Sato, K. Hosokawa, and M. Maeda
RIKEN, JAPAN

ULTRA-RAPID MELTING CURVE ANALYSIS ON BEADS FOR HIGH-THROUGHPUT GENOTYPING OF SINGLE NUCLEOTIDE POLYMORPHISM

A. Russom¹, S. Haas¹, A.J. Brookes²,
H. Andersson¹, and G. Stemme¹
¹*The Royal Institute of Technology, SWEDEN* and
²*Karolinska Institute, SWEDEN*

4:50 PM - 5:10 PM

RAPID, PARALLEL-THROUGHPUT, MULTIPLE ANALYTE IMMUNOASSAYS WITH ON-BOARD CONTROLS ON AN INEXPENSIVE, DISPOSABLE MICROFLUIDIC DEVICE

K. Nelson, J.O. Foley, A. Mashadi-Hosseini, and P. Yager
University of Washington, USA

NON-MARKOVIAN TRANSPORT OF LONG DNA IN MICROFABRICATED ARRAYS

N. Minc, J.-L. Viovy, and K.D. Dorfman
Institut Curie, FRANCE

5:10 PM - 5:30 PM

SOFT LITHOGRAPHY-BASED NANO-WELL SERS SUBSTRATE FOR LABEL-FREE BIOMOLECULAR DETECTION CHIP

G.L. Liu and L.P. Lee
University of California at Berkeley, USA

ALLOCATION DEPENDENCE OF NANO-PILLARS FOR DNA ELECTROPHORESIS SEPARATION

R. Ogawa¹, A. Oki¹, S. Hashioka¹,
N. Kajii², Y. Baba², and Y. Horiike¹
¹*National Institute for Materials Science, JAPAN* and ²*Nagoya University, JAPAN*

5:30 p.m.

Adjourn for the day

7:00 p.m.

Optional Conference Banquet

Evening in the Stars

(Ticket Required)



photo courtesy of Lee Irons


Wednesday, October 12, 2005

8:30 a.m. - 9:10 a.m.

Plenary VChair: **J.M. Ramsey, University of North Carolina at Chapel Hill****FEMTOLITER REACTION CHAMBER FOR SINGLE-MOLECULE STUDIES OF BIOLOGICAL REACTIONS**H. Noji
Osaka University, JAPAN

9:10 a.m. - 9:15 a.m.

Announcement of MicroTAS 2006 Conference

SALON F/G**Session 3A1**

New Continuous Separation Devices

Session Chair:

G. Stemme, *Royal Institute of Technology***SALON E****Session 3B1**

Highly Sensitive Optical Detection

Session Chair:

L. Lee, *University of California at Berkeley***9:15 AM - 9:35 AM****ON-CHIP CIRCULAR SHEAR DRIVEN CHROMATOGRAPHY**X. Yang¹ and A. Manz²¹Imperial College London, UK and²ISAS-Institute for Analytical Sciences, GERMANY**OPTOFLUIDIC MICROSCOPE - A MINIATURE MICROSCOPE ON A CHIP**X. Heng¹, D. Erickson²,
D. Psaltis¹, and C. Yang¹¹California Institute of Technology, USA and²Cornell University, USA**9:35 AM - 9:55 AM****SCANNING TEMPERATURE GRADIENT FOCUSING FOR SIMULTANEOUS CONCENTRATION AND SEPARATION OF COMPLEX SAMPLES**D. Ross, K.M. Balss, S.J. Hoebel, B.J. Jones,
C. Malliaris, and W.N. Vreeland*NIST, USA***AN IN VIVO IMPLANTABLE DUAL-FUNCTIONAL MICRODEVICE FOR SIMULTANEOUS PHOTOENERGY TRANSMISSION/DETECTION AND NEUROCHEMICAL DELIVERY ANALYSIS**L.-W. Lo¹, S.H.-Y. Huang¹,
P.-J. Tsai², S.-W. Lo³, and C.-S. Yang¹¹National Health Research Institutes, TAIWAN,²Taichung Veteran General Hospital, TAIWAN, and³National Yunlin University of Science and Technology, TAIWAN**9:55 AM - 10:15 AM****CONTINUOUS PI-BASED SORTING OF PROTEINS AND PEPTIDES IN A MICROFLUIDIC CHIP USING DIFFUSION POTENTIAL**

Y. Song and J. Han

*Massachusetts Institute of Technology, USA***CIRCULAR DICHROISM THERMAL LENS MICROSCOPE FOR SELECTIVE AND SENSITIVE DETECTION OF CHIRAL SAMPLES ON MICROCHIP**K. Mawatari¹, M. Yamauchi², A. Hibara²,
M. Tokeshi³, and T. Kitamori²¹Kanagawa Academy of Science and Technology, JAPAN,²University of Tokyo, JAPAN, and³Institute of Microchemical Technology, JAPAN

10:15 a.m. - 10:45 a.m. | Break

SALON F/G**Session 3A2**

Separations and Nanostructures

Session Chair:

S. Verpoorte, *University of Groningen***SALON E****Session 3B2**

Arrays

Session Chair:

J. Nilsson, *Lund Institute of Technology***10:45 AM - 11:05 AM****ON-CHIP SEPARATION AND CONCENTRATION PROCESSES BASED ON THE USE OF CHARGE SELECTIVE NANOCHANNELS**

A. Plecis, R.B. Schoch, and P. Renaud

*EPFL, SWITZERLAND***MICROFLUIDIC PROBE WITH HYDRODYNAMIC FLOW CONFINEMENT**D. Juncker^{1,2}, H. Schmid¹,
and E. Delamar¹¹IBM Research GmbH, SWITZERLAND and²ETH Zurich, SWITZERLAND

11:05 AM - 11:25 AM
ON-CHIP PRECONCENTRATION OF PROTEINS FOR PICOMOLAR DETECTION IN ORAL FLUIDS

 A. Hatch¹, A.E. Herr¹, D.J. Throckmorton¹, J.P. Brennan¹, W.V. Giannobile², and A.K. Singh¹
¹Sandia National Laboratories, USA and

²University of Michigan, USA

DYNAMIC ARRAYS: COMBINATORIAL MICROFLUIDIC SYSTEMS FOR HIGH-THROUGHPUT PCR

 G.R. Facer, A. Daridon, E. Quan, J. Huang, C. Cesar, B. Clerkson, R. Ramakrishnan, L. Zhao, B. Fowler, Y. Amin, L.J. McBride, and M.A. Unger
Fluidigm Corporation, USA
11:25 AM - 11:45 AM
POROUS POLYMER MONOLITHS IN POLYMERIC MICROFLUIDIC DEVICES FOR NANO-ELECTROSPRAY MASS SPECTROMETRY

 M. Bedair and R. Oleschuk
Queen's University, CANADA
FAST MICROARRAY FUNCTIONALIZATION WITH PROBE BEADS FOR LAB-ON-CHIP AFFINITY ASSAY

 J. Auerswald¹, D. Widmer², N.F. de Rooij^{2,3}, T. Stöckli¹, A. Sigrist⁴, T. Staubli⁴, and H.F. Knapp¹
¹Swiss Center for Electronics and Microtechnology (CSEM SA), SWITZERLAND, ²Ecole Polytechnique Fédérale de Lausanne (EPFL), SWITZERLAND, ³Université de Neuchâtel, SWITZERLAND, and ⁴University of Applied Sciences, Lucerne, SWITZERLAND

11:45 a.m. - 1:30 p.m.

Grab 'n Go Lunch

1:30 p.m. - 2:10 p.m.

Plenary VI

 Chair: **T. Kitamori**, *University of Tokyo*
TOOLS TO STUDY INDIVIDUAL GENES AND PROTEINS

U. Landegren, J. Banér, F. Dahl, J. Göransson, M. Gullberg, S. Gustafsdottir, S. Hanriksson, M. Howell, J. Jarvius, M. Jarvius, H. Johansson, M. Kamali, C. Larsson, K.J. Leuchowius, J. Melin, F. Nikolajeff, M. Nilsson, E. Schallmeiner, O. Söderberg, and J. Stenberg

Uppsala University, SWEDEN

2:15 p.m. - 4:30 p.m.

Poster Session 3 (*floorplan on page 60*)

microfluidics - fluid manipulation
W1A
A HYBRID PASSIVE MICROMIXER CAPABLE OF EFFICIENT MIXING OVER A WIDE RANGE

 A.P. Sudarsan and V.M. Ugaz
Texas A&M University, USA
W2A
A METHODOLOGY FOR RAPID PROTOTYPING MICROFLUIDIC DEVICES WITH SOPHISTICATED FUNCTIONALITY

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W3A
A PLANAR 3-STAGE MICROMIXER

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W4A
AC ELECTROKINETIC ENHANCEMENT FOR BIOSENSORS

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W5A
AN INTEGRATED DROPLET MANIPULATION DEVICE USING SURFACE ACOUSTIC WAVE

A. Yamamoto, M. Nishimura, N. Tsukada, and T. Higuchi

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W6A
DIELECTROPHORETIC ELECTRODE ARRAY FOR OPTIMUM CELL FLOW IN PRESSURE DRIVEN FLOW

 H. Shintaku¹, S. Kawano², T. Suzuki¹, I. Kanno¹, and H. Kotera¹
¹Kyoto University, JAPAN and ²Tohoku University, JAPAN

W7A
FABRICATION AND CHARACTERIZATION OF FAST-ACTING PELTIER-ACTUATED MICROVALVES

R.P. Welle and B.S. Hardy

The Aerospace Corporation, USA

- W8A** FAST SOLUTION EXCHANGE MICROFLUIDIC DEVICE FOR THE KINETICS ANALYSIS OF SINGLE CELLS
P. Sabounchi, C. Ionescu-Zanetti, R. Chen, and L.P. Lee
University of California at Berkeley, USA
- W9A** INVESTIGATION ON MICROFLUID FOCUSING BY PHASE TRANSFORMATION OF LIQUID AND ANALYTICAL EVALUATION
S.U. Son¹, D.J. Kim², and S.S. Lee¹
¹*Korea Advanced Institute of Science and Technology, KOREA* and
²*Korea Institute of Machinery and Materials, KOREA*
- W10A** OPPOSING ELECTROKINETIC AND HYDRODYNAMIC FLOWS: PARTICLE MIXING AND CONCENTRATION DEVICES
A.J. Skulan, L.M. Barrett, G.J. Fiechtner, M.P. Kanouff, A.K. Singh, E.B. Cummings, and B.A. Simmons
Sandia National Laboratories, USA
- W11A** PERMEATION INDUCES FLOWS IN SILICONE BASED MICROFLUIDICS
E. Verneuil, A. Buguin, and P. Silberzan
Institut Curie, FRANCE
- W12A** PHASEGUIDE STRUCTURES FOR PIPETTE ACTUATED LAMINAR FLOW BASED SELECTIVE SAMPLE RECOVERY
P. Vulto^{1,2}, G. Medoro³, G. Igel², J. Kieninger², G. Urban², M. Tartagni¹, R. Guerrieri¹, and N. Manaresi³
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³*Silicon Biosystems s.r.l., ITALY*
- W13A** RAPID MIXING BASED ON AC ELECTROOSMOSIS IN MICROCHANNEL
N. Sasaki¹, T. Kitamori^{1,2,3}, and H.-B. Kim^{1,2,3}
¹*University of Tokyo, JAPAN*,
²*Kanagawa Academy of Science and Technology, JAPAN*, and
³*Japan Science and Technology Corporation, JAPAN*
- W14A** SIMPLE CONSTANT VOLUME INJECTION PUMP FOR DROPLET SEPARATION IN MASSIVELY PARALLEL MICROFLUIDIC DEVICES
T. Shimomura, E. Tamiya, and Y. Takamura
Japan Advanced Institute of Science and Technology, JAPAN
- W15A** SUPER-HYDROPHOBIC PASSIVE MICROVALVE FOR MANIPULATING PROTEIN-CONTAINING LIQUIDS
T. Yasuda, M. Ezoe, and K. Ishizuka
Kyushu Institute of Technology, JAPAN
- W16A** UTILIZING SILICA MONOLITHS IN MICROCHIPS FOR ELECTROCHROMATOGRAPHIC SEPARATIONS
D. Xiao and J.M. Ramsey
University of North Carolina, USA
- W17A** VISUALIZATION AND OPTIMIZATION FOR FLUID FLOW OF TRAVELING WAVE MICROPUMP USING MICROPIV AND NUMERICAL SIMULATION
T. Suzuki¹, H. Hata¹, H. Shintaku¹, I. Kanno¹, S. Kawano², and H. Kotera¹
¹*Kyoto University, JAPAN* and ²*Tohoku University, JAPAN*

microfluidics - fluid mechanics and modeling

- W18A** 3D PARTICLE SHAPE SENSOR UTILIZING ELECTRO-ORIENTATION
P. Turmezei, J.R. Mollinger, and A. Bossche
Delft University of Technology, THE NETHERLANDS
- W19A** INDUCING STRONG VISCOELASTIC EFFECTS IN LOW-VISCOSITY DILUTE POLYMER SOLUTIONS USING COMPLEX MICROFLUIDIC GEOMETRIES
L. Rodd^{1,3}, J.J. Cooper-White^{1,2}, D.V. Boger¹, and G.H. McKinley³
¹*University of Melbourne, AUSTRALIA*,
²*University of Queensland, AUSTRALIA*, and
³*Massachusetts Institute of Technology, USA*
- W20A** MODELING OF A MICRO FLOW STABILIZING DEVICE FOR LAB-ON-A-CHIP APPLICATIONS
B. Yang and Q. Lin
Carnegie Mellon University, USA

- W21A** | **PRODUCING CONTROLLED CONCENTRATION GRADIENTS ALONG MICROCHANNELS**
B. Lonetti, J. Goulpeau, A. Ajdari, and P. Tabeling
ESPCI, FRANCE
- W22A** | **STRUCTURED SYNTHESIS OF PLANAR DILUTION NETWORKS**
P.K. Yuen¹ and C.H. Mastrangelo²
¹*Corning Incorporated, USA and*
²*Case Western Reserve University, USA*

microfluidics - multi phase fluidics

- W23A** | **CONTROLLING DROPLET EMISSION WITH INTEGRATED ACTUATORS IN MICROFLUIDIC SYSTEMS**
H. Willaime, V. Barbier, and P. Tabeling
ESPCI, FRANCE
- W24A** | **DYNAMIC SORTING OF SATELLITE DROPLETS AS THE BASIS FOR MONODISPERSED SUBMICRON EMULSIFICATION SYSTEM**
Y.-C. Tan, Y.L. Ho, and A.P. Lee
University of California at Irvine, USA
- W25A** | **DYNAMICAL MULTIPHASE STRUCTURES IN THE MICROSYSTEM APPROACH TO ARTIFICIAL CELLS**
P.F. Wagler¹, U. Tengen², T. Maeke², S. Chemnitz², M. Heymann², M. Jünger², T. Palutke¹, and J.S. McCaskill²
¹*Fraunhofer Gesellschaft, GERMANY and* ²*Ruhr-Universität-Bochum, GERMANY*
- W26A** | **MICRO PLATFORM FOR INVESTIGATION OF EXPLOSIVE VAPORIZATION IN MICRO ENCLOSURES**
G. Romera-Guereca, J. Lichtenberg, A. Hierlemann, and D. Poulikakos
ETH Zurich, SWITZERLAND
- W27A** | **MICROSCOPIC RADIATION-PRESSURE INTERFACE DEFORMATION METHOD FOR CHARACTERIZATION OF MICRO LIQUID INTERFACES**
A. Hibara^{1,2,3}, T. Ikemoto¹, K. Mawatari², and T. Kitamori^{1,2,3}
¹*University of Tokyo, JAPAN,*
²*Kanagawa Academy of Science and Technology, JAPAN, and*
³*Japan Science and Technology Agency, JAPAN*
- W28A** | **PHASE SEPARATION OF ORGANIC-AQUEOUS DROPLETS AND SEGMENTED MIXED PHASE FLOWS BY USING A CAPILLARITY RESTRICTED SURFACE MODIFICATION**
S. Matsuoka, K. Hosoda, M. Ueno, A. Hibara, and T. Kitamori
University of Tokyo, JAPAN
- W29A** | **SEGMENTATION FOR ENHANCED DETECTION, STORAGE, AND ROUTING OF ANALYTES**
D.S. Reichmuth and E.B. Cummings
Sandia National Laboratories, USA
- W30A** | **STABILIZATION OF TWO PHASE OCTANOL/WATER FLOWS IN PDMS CHANNELS USING POLYMERIC WALL COATINGS**
H.J. van der Linden, L.C. Jellema, M. Holwerda, and E. Verpoorte
University of Groningen, THE NETHERLANDS

microfluidics - world-to-chip interfacing

- W31A** | **DEVELOPMENT OF MICROFLUIDIC INTERFACES FOR A SURFACE ACOUSTIC WAVES (SAW) BIOSENSOR SYSTEM**
I. Stoyanov, M. Tewes, S. Glass, T.M.A. Gronewold, M. Koch, and M. Löehndorf
Center of Advanced European Studies and Research (CAESAR), GERMANY
- W32A** | **OPTICAL CONNECTOR PLUGS FOR MULTIPLEXED AND SIMULTANEOUS DETECTION PURPOSES IN MICROFLUIDIC SYSTEMS**
G. Perozziello¹, Z. Zhang², D. Snakenborg¹, J.P. Kutter¹, K.F. Jensen², and O. Geschke¹
¹*Technical University of Denmark, DENMARK and*
²*Massachusetts Institute of Technology, USA*

microfluidics - others

- W33A** | **A MICROFABRICATED VAPOR-JET PUMP FOR LOW PRESSURE GENERATION**
M. Doms, J.-P. Hauschild, and J. Müller
Hamburg-Harburg University of Technology, GERMANY
- W34A** | **A TUNABLE LIQUID MICROLENS DRIVEN BY TEMPERATURE-SENSITIVE HYDROGEL**
L. Dong, A.K. Agarwal, S.S. Sridharamurthy, D.J. Beebe, and H. Jiang
University of Wisconsin at Madison, USA
- W35A** | **INFRARED THERMAL IMAGING OF MICROFLUIDIC CHIPS**
S. Franssila¹, K. Grigoras¹, S. Marttila¹, R. Lehtiniemi²,
C.-M. Fager², and J. Manninen²
¹Helsinki University of Technology, FINLAND and
²Nokia Research Center, FINLAND
- W36A** | **POLYMERIC MICROFLUIDIC DEVICE FOR ON-CHIP CELL LYSIS AND EXTRACTION OF NUCLEIC ACIDS FROM BIOLOGICAL SAMPLES**
A. Bhattacharyya and C. Klapperich
Boston University, USA

microfabrication - MEMS

- W37B** | **DETECTION OF VOLATILE ORGANIC COMPOUNDS IN LIQUID ENVIRONMENTS USING FULLY INTEGRATED CMOS RESONANT CANTILEVERS**
C. Vancura¹, Y. Li¹, J. Lichtenberg¹, F. Josse², and A. Hierlemann¹
¹ETH Zurich, SWITZERLAND and ²Marquette University, USA
- W38B** | **FABRICATION AND PERFORMANCE OF A DUAL-ELECTRODE ELECTROSTATIC PERISTALTIC GAS MICROPUMP**
H. Kim, K. Najafi, A. Astle, L.P. Bernal, and P.D. Washabaugh
University of Michigan, USA
- W39B** | **LOCALIZED STIMULATION OF AND RECORDING FROM NEURAL CELLS WITH FLUID INJECTABLE NEURONAL MICRONEEDLES**
S.-J. Paik, A. Lee, K.-I. Koo, S. Park, M.-J. Jeong, H.M. Choi,
J.-M. Lim, S.J. Oh, S.J. Kim, and D. Cho
Seoul National University, KOREA
- W40B** | **PIEZOELECTRIC MICROCANTILEVER FOR MOLECULAR BINDING FORCE MEASUREMENTS**
K.H. Gilchrist¹, D.E. Dausch¹, C.J. Harris², and R.L. Clark²
¹RTI International, USA and ²Duke University, USA
- W41B** | **SINGLE-MASK FABRICATION PROCESS FOR HIGH ASPECT-RATIO EMBEDDED MICROCHANNELS WITH OPENINGS**
T. Suzuki¹, T. Tokuda¹, N. Fujiwara¹, H. Yamamoto¹,
I. Kanno¹, M. Washizu², and H. Kotera¹
¹Kyoto University, JAPAN and ²University of Tokyo, JAPAN
- W42B** | **STAINLESS-STEEL DIAPHRAGM MICROPUMP FOR MICRO-CHEMICAL PROCESSES**
T. Aono¹, A. Koide², R. Miyake², and T. Kitamori³
¹The Research Association of Micro Chemical Process Technology, JAPAN,
²Hitachi, Ltd., JAPAN and ³University of Tokyo, JAPAN
- W43B** | **SU-8 BASED ARCH-LIKE MICROFLUIDIC MICROCHANNELS USING SINGLE MASK/SINGLE STEP PHOTOLITHOGRAPHY**
M. Gaudet^{1,2}, S. Arscott¹, J.C. Camart², and L. Buchaillet¹
¹Institut d'Electronique et de Microelectronique et de Nanotechnologie, FRANCE and
²University of Lille, FRANCE

microfabrication - micromachining

- W44B** | **DESIGN AND PROTOTYPING OF A SURFACE MICROMACHINED PARYLENE MICROVALVE WITH HYBRID ACTUATION SCHEME: ON-CHIP THERMOPNEUMATIC INITIATION AND ELECTROSTATIC LATCHING**
K. Ryu, X. Wang, K. Shaikh, E. Goluch, P. Mathias, and C. Liu
University of Illinois at Urbana-Champaign, USA
- W45B** | **MICROFABRICATED CYLINDRICAL ION TRAP MASS SPECTROMETER ARRAYS**
A. Chaudhary, F.H.W. van Amerom, J. Bumgarner, and R.T. Short
University of South Florida, USA
- W46B** | **RAPID PROTOTYPING METHODS FOR ALL-COC/TOPAS® WAVEGUIDES AND MICROFLUIDIC SYSTEMS**
F. Bundgaard, G. Perozziello, and O. Geschke
Technical University of Denmark, DENMARK

microfabrication - polymer technology

- W47B** | **A NEW SPIRALLY-ROLLED POLYMER MICROTUBE WITH BIOSENSORS FOR SMART MICROCATETER**
C. Li, C. Gao, J. Han, and C.H. Ahn
University of Cincinnati, USA
- W48B** | **ALL OPTICALLY CONTROLLED MICROMANIPULATION SYSTEMS**
S. Maruo and Y. Hiratsuka
Yokohama National University, JAPAN
- W49B** | **BIOSENSORS BASED ON PARYLENE CANTILEVERS**
W. Khalid¹, R. Katragadda¹, Y. Zhao², Q. Lin², and Y. Xu¹
¹Wayne State University, USA and ²Carnegie Mellon University, USA
- W50B** | **COST EFFECTIVE PLASTIC MICRO DIRECT METHANOL FUEL CELL (μ DMFC)**
M. Ishizuka¹, T. Suzuki¹, H. Shinohara¹, H. Houjou¹, S. Motokawa¹, J. Mizuno¹, T. Momma^{1,2}, T. Osaka¹, and S. Shoji¹
¹Waseda University, JAPAN and ²CREST, JST, JAPAN
- W51B** | **SELF-RAISED CIRCULAR ORIFICES FOR LATERAL PATCH-CLAMPING ARRAY CHIPS**
J. Seo and L.P. Lee
University of California at Berkeley, USA
- W52B** | **MICROFLUIDIC-BASED PLGA NANOSPHERE GENERATOR FOR PROTEIN COATING**
L.-H. Hung¹, A.T. Hsieh¹, N. Portney², and A.P. Lee¹
¹University of California at Irvine, USA and ²University of California at Riverside, USA
- W53B** | **NEW STRAIGHT-FORWARD FABRICATION TECHNIQUE FOR THE PRODUCTION OF THIN POLYMERIC MICROFLUIDIC DEVICES WITH TUNABLE POROSITY**
J. de Jong, B. Ankoné, R.G.H. Lammertink, and M. Wessling
University of Twente, THE NETHERLANDS
- W54B** | **NOVEL, FAST AND FLEXIBLE METHODS FOR FABRICATION OF POLYMER-BASED OPTICAL WAVEGUIDES**
D. Snakenborg, G. Perozziello, O. Geschke, and J.P. Kutter
Technical University of Denmark, DENMARK

microfabrication - others

- W55B** | **FABRICATION OF A TITANIUM MICROELECTRODE CHIP TO INVESTIGATE BULK TITANIUM MICROMACHINING CAPABILITY FOR MICROFLUIDIC DEVICES**
Y.T. Zhang, F. Bottausci, M.P. Rao, I. Mezic, and N.C. MacDonald
University of California at Santa Barbara, USA

nanotechnology - nanobiotechnology

- W56C** | **NANOPHOTONIC CRESCENT STRUCTURES WITH SHARP EDGE FOR ULTRASENSITIVE BIOMOLECULAR DETECTIONS BY LOCAL ELECTROMAGNETIC FIELD ENHANCEMENT EFFECT**
Y. Lu, G.L. Liu, J. Kim, Y.X. Mejia, and L.P. Lee
University of California at Berkeley, USA
- W57C** | **ACTIVE DIRECTIONAL CONTROL OF BIOMOLECULAR MOTOR-DRIVEN MICROTUBULES WITH ELECTRIC FIELDS**
T.S. Kim, M.-T. Kao, E.F. Hasselbrink, and E. Meyhöfer
University of Michigan, USA
- W58C** | **FUNCTIONALIZED PT NANOWIRE ARRAY BY IMMOBILIZING GLUCOSE OXIDASE (GOX) IN POLYPYRROLE (PPY)**
C. Lee¹, J. Wang², H.G. Monbuquette², and M. Yun³
¹*Jet Propulsion Laboratory, USA,*
²*University of California at Los Angeles, USA, and*
³*University of Pittsburgh, USA*
- W59C** | **HIGH-SPEED SWITCHING OF CHEMICAL STIMULATION FOR SINGLE MOLECULAR ANALYSIS IN CONTINUOUS-FLOW FORMAT**
S.W. Lee¹, T. Yamamoto², H. Noji², and T. Fujii¹
¹*University of Tokyo, JAPAN and* ²*Osaka University, JAPAN*
- W60C** | **MICROFLUIDIC FUEL SOURCES FOR KINESIN POWERED MOLECULAR MOTORS**
J.R. Wasylcia¹, S. Sapelnikova¹, S. Marcus¹, H. Jeong², J. Dragoljic³, and D.J. Harrison¹
¹*University of Alberta, CANADA,* ²*Sookmyung Womens University, KOREA, and*
³*Advanced Integrated Microsystems Limited, CANADA*
- W61C** | **OPTIMIZATION OF A MICROFLUIDIC CHIP FOR THE BIOBARCODE ASSAY**
E.D. Goluch¹, J.-M. Nam², S.I. Stoeva², D.G. Georganopoulou², K.A. Shaikh¹, K.S. Ryu¹, T.N. Chiesi², A.E. Barron², C.A. Mirkin², and C. Liu¹
¹*University of Illinois at Urbana-Champaign, USA and*
²*Northwestern University, USA*
- W62C** | **POLYMER MICROFLUIDIC DEVICES FOR THE FORMATION AND INVESTIGATION OF ARTIFICIAL BILAYER LIPID MEMBRANE (BLM) SYSTEMS**
M.E. Sandison and H. Morgan
University of Southampton, UK

nanotechnology - nanofluidics

- W63C** | **CONCENTRATION AND SEPARATION OF IONIC ANALYTES USING NANO-MICROCHANNEL JUNCTIONS**
N.J. Petersen and J.M. Ramsey
University of North Carolina at Chapel Hill, USA
- W64C** | **NMR STUDY OF LIQUIDS CONFINED IN NANOCHANNELS**
T. Tsukahara^{1,2}, A. Hibara^{1,3}, and T. Kitamori^{1,2,3}
¹*University of Tokyo, JAPAN,*
²*Japan Science and Technology Agency (CREST), JAPAN, and*
³*Kanagawa Academy of Science and Technology, JAPAN*
- W65C** | **ULTRA-RAPID AND RELATIVE HUMIDITY INDEPENDENT DRYING OF NANOCHANNELS**
J.C.T. Eijkel¹, B. Dan², J.G. Bomer¹, and A. van den Berg¹
¹*University of Twente, THE NETHERLANDS and*
²*Indian Institute of Technology, INDIA*

nanotechnology - nanoengineering

- W66C** | **HIGHLY EFFICIENT PROTEIN CAPTURE AND ENZYME REACTOR BEDS BASED ON ULTRA-HIGH-ASPECT-RATIO NANOSTRUCTURES (UHARNS)**
G. Chen, J.G. Bolivar, S.A. Soper, and R.L. McCarley
Louisiana State University, USA

materials & surfaces - surface modifications

- W67D** | **AQUEOUS ELUTION CONTROL IN WETTABILITY MODULATED MICROCHANNELS GRAFTED WITH THERMORESPONSIVE POLYMERS**
 N. Idota^{1,3}, A. Kikuchi^{2,3}, J. Kobayashi^{2,3}, K. Sakai¹, and T. Okano^{2,3}
¹Waseda University, JAPAN, ²Tokyo Women's Medical University, JAPAN, and ³Japan Science and Technology Agency, JAPAN
- W68D** | **FAST SELECTIVE SURFACE MODIFICATION OF MICROFLUIDIC PRINTHEADS FOR IMPROVEMENT OF DROPLET EJECTION**
 O. Gutmann¹, C.P. Steinert¹, G. Dernick², B. de Heij¹, C. Fattinger², U. Certa², R. Zengerle¹, and M. Daub¹
¹IMTEK, University of Freiburg, GERMANY and ²F. Hoffmann-LaRoche AG, SWITZERLAND
- W69D** | **FUNCTIONALITY AND STABILITY OF HEPARIN IMMOBILIZED ONTO POLY (DIMETHYLSILOXANE)**
 S. Thorslund, J. Sanchez, R. Larsson, F. Nikolajeff, and J. Bergquist
 Uppsala University, SWEDEN
- W70D** | **MULTI-STEP LAPLACE PRESSURE VALVES PREPARED BY PHOTOCATALYTIC ANALOG LITHOGRAPHY**
 G. Takei¹, M. Nonogi¹, A. Hibara^{1,2,3}, T. Kitamori^{1,2,3}, and H.-B. Kim^{1,2,3}
¹University of Tokyo, JAPAN, ²Kanagawa Academy of Science and Technology, JAPAN, and ³Japan Science and Technology Agency, JAPAN
- W71D** | **MODIFICATION OF MICROFLUIDIC CHANNELS WITH SMART POLYMERS FOR AN "ON-OFF" SWITCHABLE MOLECULAR TRAP**
 M. Ebara, J.M. Hoffman, A.S. Hoffman, and P.S. Stayton
 University of Washington, USA
- W72D** | **POROUS PDMS - MICROCHANNELS COATING**
 D. Stadnik^{1,2}, M. Juchniewicz¹, M. Chudy¹, Z. Brzózka¹, and A. Dybko¹
¹Warsaw University of Technology, POLAND and ²Institute of Electronic Materials Technology, POLAND

materials & surfaces - nanostructured materials

- W73D** | **FABRICATION OF NANO-PATTERNED SURFACES FOR CELL ADHESION IN MICROCHIPS**
 M. Goto¹, K. Sato^{2,3}, M. Yamato^{3,4}, A. Hibara^{1,2,3}, and T. Kitamori^{1,2,3}
¹University of Tokyo, JAPAN, ²Kanagawa Academy of Science and Technology, JAPAN, ³Japan Science and Technology Agency, JAPAN, and ⁴Tokyo Women's Medical University, JAPAN
- W74D** | **NUMERICAL STUDIES OF GOLD NANO-CRESCENT PROBE WITH HIGH LOCAL FIELD ENHANCEMENT FACTOR**
 J. Kim, G.L. Liu, Y. Lu, and L.P. Lee
 University of California at Berkeley, USA

materials & surfaces - others

- W75D** | **EVALUATION OF THE VIABILITY OF HL60 CELLS IN CONTACT WITH COMMONLY USED MICROCHIP MATERIALS**
 F. Wolbers, P.M. ter Braak, S. Le Gac, R. Lutttge, H. Andersson, I. Vermes, and A. van den Berg
 University of Twente, THE NETHERLANDS

applications - genomics and proteomics

- W76E** | **A POLYMER DEVICE FOR REAL-TIME PCR IN MICRODROPLETS IN A CONTINUOUS-FLOW CHIP**
 A. Macaskill¹, S. Mohr¹, P.R. Fielden¹, N.J. Goddard¹, P.J.R. Day¹, and P.A. Auroux²
¹University of Manchester, UK and ²Imperial College of Science, Technology and Medicine, UK
- W77E** | **ANALYSIS OF LIPOPROTEINS BY MICROCHIP ELECTROPHORESIS WITH HIGH-SPEED AND HIGH-REPRODUCIBILITY**
 G. Ping¹ and Y. Baba^{1,2}
¹Nagoya University, JAPAN and ²National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

W78E ON CHIP PCR AMPLIFICATION WITH INTEGRATED LATERAL FLOW DETECTION

Z. Chen, J. Wang, M.G. Mauk, H.H. Bau, C. Davis,
G. Tong, F. Winslow, W.R. Abrams, and D. Malamud
University of Pennsylvania, USA

W79E SIMULTANEOUS RECONSTITUTION OF MULTIPLE PLANAR LIPID BILAYERS

H. Suzuki, K.V. Tabata, H. Noji, and S. Takeuchi
University of Tokyo, JAPAN

W80E STATUS OF GENOME-CENTER DNA SEQUENCING TECHNOLOGY ON MEMS

D.J. Ehrlich, S.A. El-Difrawy, N. Goedecke, B.K. Mckenna,
E.A. Gismondi, R. Lam, and J.H. Aborn
Massachusetts Institute of Technology, USA

applications - clinical diagnostics
W81E A DISPOSABLE INTEGRATED LAB-ON-A-CHIP PROTOTYPE OF BLOOD TYPING MICROFLUIDIC BIOCHIP FABRICATED BY INJECTION MOLDING

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¹*Pohang University of Science and Technology, KOREA,*
²*University of Cincinnati, USA,* and ³*Ohio State University, USA*

W82E ELECTROCHEMICAL APPROACH TO PATTERN PROTEINS AND CELLS WITHIN MICROCHANNELS

H. Kaji, M. Hashimoto, K. Tsukidate, T. Matsue, and M. Nishizawa
Tohoku University, JAPAN

W83E HEALTHCARE CHIP BASED ON INTEGRATED ELECTROCHEMICAL SENSORS USED FOR CLINICAL DIAGNOSIS, BUN OF AND CREATINE

C.-H. Chang¹, H. Ogawa², M. Nagai², A. Oki¹,
M. Takai³, H. Hisamoto⁴, and Y. Horii¹
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³*University of Tokyo, JAPAN,* and ⁴*University of Hyogo, JAPAN*

W84E IMMUNODETECTION OF CIRCULATING TUMOR CELLS USING MICROFLUIDICS

S. Nagrath, S. Murthy, D. Irimia, and M. Toner
Harvard University Medical School, USA

W85E A MICROCHIP-ENZYME ASSAY FOR LACTATE DEHYDROGENASE ISOENZYMES

G.-S. Zhuang¹, J. Liu¹, K.-D. Liu¹, C.-P. Jia¹, H.-M. Wang²,
Q.-H. Jin¹, J.-L. Zhao¹, and M.-S. Yang³
¹*Chinese Academy of Sciences, CHINA,*
²*Affiliated Hospital of Nantong University, CHINA,* and
³*City University of Hong Kong, CHINA*

W86E MICROFLUIDIC IMMUNOCHEMICAL TEST STRIP WITH OLIGONUCLEOTIDE-LABELED ANTIBODY

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³*University of Tokyo, JAPAN*

W87E MICROFLUIDIC ANALYSIS SYSTEM FOR MULTIPLE BLOOD CHEMICALS

R. Koyama¹, N. Okayama¹, K. Shimoide², M. Kitaoka¹, and T. Kitamori³
¹*The Research Association of Micro Chemical Process Technology, JAPAN,*
²*Asahi Kasei Corporation, JAPAN,* and ³*University of Tokyo, JAPAN*

W88E RAPID BREAST CANCER GENE DETECTION IN PICOLITER DROPLET

A.T.-H. Hsieh, L.-H. Hung, and A.P. Lee
University of California at Irvine, USA

W89E SEPARATION-FREE DETECTION OF LOW-ABUNDANT BIOMOLECULES WITH TWO-COLOR COLOCALIZATION OF QUANTUM DOT PROBES

Y.-P. Ho, M.C. Kung, and T.-H. Wang
The Johns Hopkins University, USA

applications - microarrays

- W90E** | **DIFFUSION BASED CHEMICAL MICROGRADIENT ARRAY FOR CELL CULTURE**
T. Bansal and M.M. Maharbiz
University of Michigan, USA
- W91E** | **LAMINAR FLOW MICROARRAY PATTERNING BY PERPENDICULAR ELECTROKINETIC FOCUSING**
D. Kohlheyer, S. Unnikrishnan, S. Schlautmann, G.A.J. Besselink, A.J. Tudos, and R.B.M. Schasfoort
University of Twente, THE NETHERLANDS
- W92E** | **PMMA MICRO-CHANNEL ARRAY FOR BLOOD ANALYSIS FABRICATED BY HOT EMBOSING**
J. Mizuno¹, H. Shinohara¹, M. Ishizuka¹, T. Suzuki¹, G. Tazaki², Y. Kirita², T. Nishi², and S. Shoji¹
¹Waseda University, JAPAN and ²Kuraray Co., Ltd., JAPAN
- W93E** | **TOPOGRAPHIC AND CHEMICAL CONTROL OF CELLS' CONFIGURATION ON MICRO-PATTERNED SCAFFOLD CHIPS WITH ALIGNED BEADS**
K. Takahashi¹, H. Fukuda¹, T. Akagi¹, and T. Ichiki^{1,2}
¹University of Tokyo, JAPAN and ²Japan Science and Technology Agency, JAPAN

applications - separation science

- W94E** | **AN ON-CHIP WHOLE BLOOD CELL-SERUM SEPARATOR USING DYNAMIC PULSATILE PRESSURE**
J. Han and C.H. Ahn
University of Cincinnati, USA
- W95E** | **CHARACTERIZATION OF SU-8 MICROCHANNELS FOR ELECTROPHORETIC SEPARATIONS**
T. Sikanen¹, I. Korpisalo¹, S. Tuomikoski², R.A. Ketola¹, R. Kostiaainen¹, S. Franssila², and T. Kotiaho¹
¹University of Helsinki, FINLAND and ²Helsinki University of Technology, FINLAND
- W96E** | **EFFECT OF CHANNEL GEOMETRY ON BLOOD/PLASMA SEPARATION IN MICROCHANNEL BEND STRUCTURES**
C. Blatter¹, R. Jurischka¹, I. Tahhan¹, A. Schoth¹, P. Kerth², and H. Reinecke¹
¹University of Freiburg, GERMANY and ²PREVENTOR μ TBC GmbH, GERMANY
- W97E** | **ELECTROPHORESIS WITH TEMPERATURE GRADIENTS: THEORY AND EXPERIMENTS**
S.M. Kim, G.J. Sommer, and E.F. Hasselbrink, Jr.
University of Michigan, USA
- W98E** | **INTEGRATED MICROFLUIDIC OPTICAL MANIPULATION**
S.J. Cran-McGreehin, T.F. Krauss, and K. Dholakia
University of St. Andrews, UK
- W99E** | **QUANTIFICATION OF SIMPLE TANDEM REPEAT PROFILES FOR DNA FORENSICS**
N. Goedecke, B. McKenna, S. El-Difrawy, J. Aborn, E. Gismondi, and D.J. Ehrlich
Massachusetts Institute of Technology, USA
- W100E** | **SEPARATION PERFORMANCE OF THE MICRO THERMAL FIELD-FLOW FRACTIONATION SYSTEM**
S. Bargiel^{1,2}, A. Górecka-Drzazga¹, and J. Dziuban^{1,2}
¹Wroclaw University of Technology, POLAND and ²University of Franche-Comté, FRANCE

applications - cell handling and analysis

- W101E** **A CELL-PATTERNING BIOCHIP BASED ON DIELECTROPHORESIS FOR LIVER TISSUE APPLICATION**
 C.-T. Ho, P.-C. Lin, H.-Y. Chang, and C.-H. Liu
National Tsing Hua University, TAIWAN
- W102E** **A MICRO CHIP WITH GA (GLUTARALDEHYDE) - CROSSLINKED GELATIN MICRO PATTERNS FOR THE CULTURE OF SINGLE CELL**
 L.-J. Yang¹, Y.-C. Ou¹, J.-M. Wang¹, Y.-C. Chung², W.-C. Lin³, and Y.-M. Wang³
¹Tamkang University, TAIWAN, ²Mingchi University of Technology, TAIWAN, and ³Industrial Technology Research Institute (ITRI), TAIWAN
- W103E** **A MICROFABRICATED COMPARTMENTED CULTURE SYSTEM FOR ELECTROPHYSIOLOGICAL STUDIES OF NEURONS**
 S.K. Ravula¹, J.D. Glass², and A.B. Frazier¹
¹Georgia Institute of Technology, USA and ²Emory University, USA
- W104E** **CELL METABOLISM INACTIVATION IN A MICROBIOREACTOR**
 S.-M. Fendt¹, M. Werner¹, U. Krühne², O. Geschke¹, and N. Sziata¹
¹Technical University of Denmark, DENMARK and ²Danish Teknologisk Institut, DENMARK
- W105E** **CELL-BASED FIELD EFFECT DEVICES FOR CELL ADHESION ANALYSIS**
 Y. Miyahara and T. Sakata
National Institute for Materials Science, JAPAN
- W106E** **CHARACTERIZATION OF HUMAN UMBILICAL VEIN ENDOTHELIAL CELLS (HUVEC) CULTIVATED IN MICROFLUIDIC CHANNELS**
 P. Mulder, S. Koster, H. van der Linden, G. Molema, and E. Verpoorte
University of Groningen, THE NETHERLANDS
- W107E** **COMPUTERIZED MICROFLUIDIC MOUSE EMBRYO CULTURE WITH BRAILLE DISPLAYS**
 Y.S. Heo, L.M. Cabrera, W. Gu, G.D. Smith, and S. Takayama
University of Michigan, USA
- W108E** **CONTINUOUS SORTING OF MAGNETIC CELLS VIA ON-CHIP FREE-FLOW MAGNETOPHORESIS**
 N. Pamme¹ and C. Wilhelm²
¹National Institute for Materials Science, JAPAN and ²University Paris 7, FRANCE
- W109E** **DEVELOPMENT OF A MICROCHIP-BASED BIOASSAY SYSTEM CONSISTING OF A CELL CULTURE CHIP AND AN ELISA CHIP**
 K. Sato, H. Ui, T. Tokuyama, S.-I. Fujii, and M. Abo
University of Tokyo, JAPAN
- W110E** **FLOW-THROUGH MICROFLUIDIC CHIP FOR CELL TRANSFECTION BY ELECTROPERMEABILIZATION**
 A. Valero, R. Luttge, J.W. van Nieuwkasteele, H. Andersson, and A. van den Berg
University of Twente, THE NETHERLANDS
- W111E** **GENERATING CELL ARRAYS IN MICROFLUIDIC NETWORKS**
 S.P. Forry, D.R. Reyes, B.J. Polk, M. Gaitan, and L.E. Locascio
National Institute of Standards and Technology, USA
- W112E** **HIGH-YIELD ELECTROPORATION OF CELLS USING FIELD CONSTRICTION AT MICRO ORIFICES**
 M. Washizu¹, Y. Wake¹, O. Kurosawa², H. Oana¹, S. Matsuoka³, A. Noma³, and H. Kotera³
¹University of Tokyo, JAPAN, ²Advance Co., JAPAN, and ³Kyoto University, JAPAN
- W113E** **INSULATOR-BASED RIDGES FOR THE MANIPULATION OF PARTICLES AND CELLS IN MICROCHANNELS**
 L.M. Barrett, A.J. Skulan, E.B. Cummings, A.K. Singh, and G.J. Fiechtner
Sandia National Laboratories, USA
- W114E** **INTEGRATED MICROSYSTEM FOR ELECTROKINETIC CELL CONCENTRATION AND GENETIC DETECTION**
 E.T. Lagally, S.-H. Lee, and H.T. Soh
University of California at Santa Barbara, USA

- W115E** | **MICROBIOREACTOR "CASSETTE" WITH INTEGRATED FLUIDIC AND OPTICAL PLUGS FOR HIGH-THROUGHPUT BIOPROCESSING**
Z. Zhang¹, G. Perozziello², N. Szita², P. Boccazzi¹, A.J. Sinskey¹, O. Geschke², and K.F. Jensen¹
¹Massachusetts Institute of Technology, USA and ²Technical University of Denmark, DENMARK
- W116E** | **MICROFLUIDIC CELL CULTURE ARRAY FOR QUANTITATIVE BIOLOGY**
P.J. Lee, P.J. Hung, and L.P. Lee
University of California at Berkeley, USA
- W117E** | **MICROFLUIDIC DEVICE FOR STUDIES OF PRIMARY CILIUM DIRECTION SENSITIVITY**
S. Rydholm, T. Frisk, H. Andersson, G. Stemme, and H. Brismar
Royal Institute of Technology, SWEDEN
- W118E** | **MICROFLUIDIC FLUORESCENT ACTIVATED CELL SORTING WITH OPTICAL FORCES**
J. Oakey¹, T. Vestad¹, D.W.M. Marr², R. Applegate², and J. Squier²
¹Metafluidics, Inc., USA and ²Colorado School of Mines, USA
- W119E** | **ON-CHIP MICROPARTICLE HANDLING USING MAGNETICALLY DRIVEN MICRODEVICE**
H. Maruyama, F. Arai, and T. Fukuda
Nagoya University, JAPAN
- W120E** | **OPTIMIZATION OF AN ELECTROPORATION SYSTEM FOR GENE TRANSFECTION BY THE TAGUCHI METHOD**
Y.-C. Lin¹, C.-Y. Hung¹, K.-S. Huang¹, C.-S. Fang¹, and C.-H. Yang²
¹National Cheng Kung University, TAIWAN and ²I-Shou University, TAIWAN
- W121E** | **TEMPERATURE EVALUATION OF SOFT AND HARD PZT TRANSDUCERS FOR ULTRASONIC TRAPPING IN A MICROFLUIDIC PLATFORM**
L. Johansson¹, M. Nilsson², T. Lilliehorn¹, M. Almqvist², J. Nilsson², T. Laurell², and S. Johansson¹
¹Uppsala University, SWEDEN and ²Lund University, SWEDEN

applications - chemical synthesis

- W122E** | **LAMINAR FLOW BASED MICROREACTOR FOR EFFICIENT REGENERATION OF NICOTINAMIDE COFACTORS FOR BIOCATALYSIS**
S.K. Yoon¹, E.R. Choban¹, C. Kane², T. Tzedakis², and P.J.A. Kenis¹
¹University of Illinois at Urbana-Champaign, USA and ²Université Paul Sabatier, FRANCE
- W123E** | **MULTI-PHASE TWO-STEP SYNTHESIS IN MICROREACTORS**
P.J. Nieuwland¹, K. Koch¹, M. Ueno², T. Kitamori², J.C.M. van Hest¹, and F.P.J.T. Rutjes¹
¹Radboud University Nijmegen, THE NETHERLANDS and ²University of Tokyo, JAPAN
- W124E** | **THE USE OF SOLID SUPPORTED REAGENTS IN CONTINUOUS FLOW REACTORS**
C. Wiles, P. Watts, and S.J. Haswell
University of Hull, UK

applications - drug discovery

- W125E** | **FUNCTIONAL MICROCAPSULE FOR DRUG DELIVERY**
E.H. Jeong¹, S. Abraham¹, T. Arakawa², I. Kim¹, S. Shoji², K.C. Kim¹, and J.S. Go¹
¹Pusan National University, KOREA and ²Waseda University, JAPAN
- W126E** | **MICROFLUIDIC HIGH THROUGHPUT SCREENING OF ENZYME INHIBITION IN A T-SENSOR**
E. Garcia and P. Yager
University of Washington, USA

applications - environmental

- W127E** | **DEVELOPMENT OF SEMI-AUTOMATIC ANALYSIS SYSTEM WITH THE IMMUNOASSAY WAVEGUIDE SENSOR CHIP FOR DIOXIN (2, 3, 4, 7, 8 - TCDF (F114)) MEASUREMENT**
T. Katayama¹, Y. Kobayashi², K. Kawaguchi², M. Kitaoka¹, and T. Kitamori³
¹The Research Association of Micro Chemical Process Technology, JAPAN, ²Kyoto Electronics Manufacturing, JAPAN, and ³University of Tokyo, JAPAN
- W128E** | **THERMAL LENS MICROSCOPIC ANALYSES OF U(VI) AND H⁺ CONCENTRATIONS IN SOLUTIONS OF REPROCESSING PROCESSES FOR SPENT NUCLEAR FUELS USING A MICROCHIP**
H. Hotokezaka¹, M. Tokeshi², M. Harada¹, T. Kitamori^{2,3}, and Y. Ikeda¹
¹Tokyo Institute of Technology, JAPAN, ²Kanagawa Academy of Science and Technology, JAPAN, and ³University of Tokyo, JAPAN

applications - others

- W129E** | **DEVELOPMENT OF FUNCTIONAL MICRO DISPENSER ARRAY FOR PRODUCING MULTIPLE REACTION CONDITIONS**
E. Shigematsu¹, M. Yamada², M. Yasuda¹, and M. Seki¹
¹Osaka Prefecture University, JAPAN and ²University of Tokyo, JAPAN
- W130E** | **FORMATION OF MONODISPERSE GIANT LIPOSOMES USING MICRO-PATTERNED LIPID FILMS**
K. Kuribayashi and S. Takeuchi
University of Tokyo, JAPAN
- W131E** | **GENERATING NANODROPLETS WITH A MODULAR DISPENSER SYSTEM CONSISTING OF TWO REPLACABLE BASIC COMPONENTS**
R. Gransee, F. Doffing, F. Schönfeld, and K.S. Drese
Institute for Microtechnology Mainz GmbH, GERMANY
- W132E** | **ON CHIP X-RAY GENERATION**
E.D. Greaves^{1,2}, P. Jacob¹, and A. Manz¹
¹ISAS-Institute for Analytical Sciences, GERMANY and ²University Simón Bolívar, VENEZUELA
- W133E** | **PROTEIN KINETICS VIA UV/VIS AND FTIR IMAGING ON CHIP**
M.W. Toepke¹, S.H. Brewer², D. Vu², J.E. Morgan¹, K. Ganesan¹, K.D. Rector², W.H. Woodruff², R.B. Gennis¹, R.B. Dyer², and P.J.A. Kenis¹
¹University of Illinois at Urbana-Champaign, USA and ²Los Alamos National Lab, USA
- W134E** | **WATER-ACTIVATED FILM BATTERIES FOR μ TAS**
K.B. Lee and P.Y. Chow
Institute of Bioengineering and Nanotechnology, SINGAPORE

detection technologies - optical

- W135F** | **A NOVEL METHOD OF FLUORESCENCE SIGNAL DETECTION AND SPECTROSCOPY**
R. Thariani and P. Yager
University of Washington, USA
- W136F** | **AN INTEGRATED OLED ARRAY FOR THE DETECTION OF ANTIBIOTICS IN MILK**
M.M. Zourob and N.J. Goddard
University of Manchester, UK
- W137F** | **MEASUREMENT OF TEMPERATURE DISTRIBUTION IN MICROCHANNEL USING TWO COLOR LASER-INDUCED FLUORESCENCE**
H. Akimoto, S. Saeki, T. Saito, K. Nakamura, and T. Nishida
Yamaguchi University, JAPAN
- W138F** | **MOLECULAR EMISSION DETECTION OF ORGANO-PHOSPHATES USING A MINIATURISED PLASMA SOURCE**
G. Jenkins¹ and A. Manz²
¹Imperial College London, UK and ²ISAS-Institute for Analytical Sciences, GERMANY

- W139F** | **OPTICAL PH AND OXYGEN SENSING FOR MICRO-ARRAYED CELL CHIPS**
M. Suzuki, H. Nakabayashi, Y. Jing, and M. Honda
Toyama University, JAPAN
- W140F** | **QUANTIFICATION OF MIXING IN PRESSURE-DRIVEN MICROFLOWS USING Ca²⁺-SENSITIVE DYE**
D.H. Kam and E.F. Hasselbrink
University of Michigan, USA
- W141F** | **THERMAL LENS SIGNAL ENHANCEMENT BY UTILIZING TWO EXCITATION LASER PULSES**
A. Hibara^{1,2,3}, K. Mawatari^{2,3}, and T. Kitamori^{1,2,3}
¹*University of Tokyo, JAPAN,*
²*Kanagawa Academy of Science and Technology, JAPAN, and*
³*Japan Science and Technology Agency, JAPAN*

detection technologies - electrochemical

- W142F** | **SCANNING MICRO ELECTRODES FOR BIOLOGICAL CELL IMPEDANCE MEASUREMENT**
Y. Tao, R. Fasching, and F.B. Prinz
Stanford University, USA
- W143F** | **WIDE RANGE OF PARTICLE SIZE MEASUREMENT USING ON-CHIP TWO CHANNELS COULTER COUNTER**
K. Miyamura¹, M. Kitaoka¹, and T. Kitamori²
¹*The Research Association of Micro Chemical Process Technology, JAPAN and*
²*University of Tokyo, JAPAN*

detection technologies - mass spectrometry

- W144F** | **A MICROFLUIDIC DEVICE WITH INTEGRATED METAL EMITTER INCORPORATING CE AND ESI-MS INTERFACE FOR PEPTIDE AND PROTEIN ANALYSIS**
M.-S. Kim, H.-S. Joo, B.-G. Kim, and Y.-K. Kim
Seoul National University, KOREA
- W145F** | **MICROFLUIDIC DEVICE IN POLY(DIMETHYLSILOXANE) INTEGRATING SHEATHLESS ELECTROSPRAY IONIZATION AND SAMPLE PRE-TREATMENT**
P. Lindberg, S. Thorslund, A. Pettersson Dahlin, S. Bergström, P. Andrén, F. Nikolajeff, and J. Bergquist
Uppsala University, SWEDEN
- W146F** | **VERY HIGH SENSITIVITY POLYSILICON CANTILEVER ELECTROSPRAY IONIZATION (ESI) TIPS COMPATIBLE WITH STANDARD ANALYTICAL CHROMATOGRAPHY FITTINGS**
S. Arscott¹, S. Le Gac², and C. Rolando²
¹*Institut d' Electronique, de Microélectronique et de Nanotechnologie, FRANCE and*
²*Laboratoire de Chimie Organique et Macromoléculaire, FRANCE*

detection technologies - others

- W147F** | **MICROMACHINED BROADBAND RF CYTOMETER FOR HIGH-THROUGHPUT ANALYSIS OF MAMMALIAN CELLS**
S.-H. Oh, D.K. Wood, S.-H. Lee, K.Y. Dane, P.S. Daugherty, H.T. Soh, and A.N. Cleland
University of California at Santa Barbara, USA
- W148F** | **WAVELENGTH-DEPENDENT SIGNAL AMPLIFICATION POTENTIAL OF GOLD NANOCAGE TAGS FOR SURFACE PLASMON RESONANCE (SPR) IMAGING**
E. Fu, J. Foley, J. Chen, B. Wiley, Y. Xia, and P. Yager
University of Washington, USA

SALON F/G

Session 3A3
Integrated DNA Analysis
 Session Chair:
 S. Shoji, *Waseda University*

SALON E

Session 3B3
Particle Separation and Manipulation
 Session Chair:
 A. Ajdari, *ESPCI*

4:30 PM - 4:50 PM

NANOPLASMONIC BIOMOLECULAR RULERS WITH A 2 nm SPATIAL RESOLUTION FOR PROBING RESTRICTED DIGESTION OF NUCLEIC ACIDS

G.L. Liu¹, F.F. Chen², D. Gerion³, Y. Yin¹, A.P. Alivisatos¹, J.W. Gray¹, and L.P. Lee¹
¹*University of California at Berkeley, USA*,
²*Lawrence Berkeley National Laboratory, USA*, and ³*Lawrence Livermore National Laboratory, USA*

IMPROVING AGGLUTINATION TESTS BY WORKING IN MICROFLUIDIC CHANNELS

G. Degré, E. Brunet, A. Dodge, and P. Tabeling
ESPCI, FRANCE

4:50 PM - 5:10 PM

SINGLE-CELL-SCALE REVERSE TRANSCRIPTION IN A MICROFLUIDIC PDMS DEVICE: TOWARDS WHOLE TRANSCRIPTOME ANALYSIS

N. Bontoux^{1,2}, L. Dauphinot², V. Studer², M.C. Potier², J. Rossier², and Y. Chen¹
¹*LPN-CNRS, FRANCE* and ²*ESPCI, FRANCE*

CONTINUOUS DIELECTROPHORETIC SEPARATION BASED ON TRAPEZOIDAL ELECTRODE ARRAY

S. Choi and J.K. Park
Korea Advanced Institute of Science and Technology, KOREA

5:10 PM - 5:30 PM

INTEGRATED SAMPLE PROCESSING WITH REAL TIME PCR FOR MICROCHIP FORENSIC ANALYSIS

L.A. Legendre, J.P. Ferrance, K.M. Horsman, C. Guillo, J.M. Bienvenue, and J.P. Landers
University of Virginia, USA

HYDRODYNAMIC CONCENTRATION AND SEPARATION OF PARTICLES IN MICROFLUIDIC DEVICES

M. Yamada¹ and M. Seki²
¹*University of Tokyo, JAPAN* and ²*Osaka Prefecture University, JAPAN*

5:30 p.m.

| Adjourn for the day



photo courtesy of Lee Irons

Thursday, October 13, 2005

8:30 a.m. - 9:10 a.m.

Poster Awards Ceremony

 Chair: J.P. Kutter, *Technical University of Denmark*

Monday, Tuesday & Wednesday Poster Awards sponsored by MCPT

Widmer Poster Award sponsored by Royal Society of Chemistry

SALON F/G	SALON E
Session 4A1 Continuous Free Flow Devices Session Chair: J. Voldman, <i>Mass. Institute of Technology</i>	Session 4B1 Nanostructures Session Chair: A. van den Berg, <i>University of Twente</i>
9:15 AM - 9:35 AM	

A NANOFILTER ARRAY CHIP FOR FAST GEL-FREE BIOMOLECULE SEPARATION
 J. Fu and J. Han
Massachusetts Institute of Technology, USA

NANOFLUIDICALLY DEFINED DEFECTS IN PHOTONIC CRYSTALS
 D. Erickson^{1,2}, T. Rockwood¹, T. Emery¹,
 A. Scherer¹, and D. Psaltis¹
¹*California Institute of Technology, USA* and
²*Cornell University, USA*

9:35 AM - 9:55 AM

ISOTACHOPHORESIS USING A CONTINUOUS FREE-FLOW ELECTROPHORESIS DEVICE
 D. Janasek, M. Schilling,
 J. Franzke, and A. Manz
Institute for Analytical Sciences Dortmund and Berlin, GERMANY

HYBRID FABRICATION OF CARBON NANOTUBE-BASED DEVICES AND THE MEASUREMENT OF IONIC CURRENT THROUGH THEM
 B.L. Kim and H. Bau
University of Pennsylvania, USA

9:55 AM - 10:15 AM

RAPID FREE FLOW ISOELECTRIC FOCUSING VIA NOVEL ELECTRODE STRUCTURES
 J. Albrecht, S. Gaudet, and K.F. Jensen
Massachusetts Institute of Technology, USA

NANOMETER-GAP IMPEDANCE BIOSENSORS
 M. Löhndorf, U. Schlecht, A. Malavé,
 T.M.A. Gronewold, and M. Tewes
Center of Advanced Europe Studies and Research (CEASAR), GERMANY

10:15 a.m. - 10:45 a.m. | Break

Session 4A2 Protein Analysis Session Chair: J. Han, <i>Mass. Institute of Technology</i>	Session 4B2 Fluids - Basics Session Chair: M.Z. Bazant, <i>Mass. Institute of Technology</i>
10:45 AM - 11:05 AM	

VALVELESS ON-CHIP AUTOMATED PROTEIN FRACTIONATOR AND COLLECTOR UTILIZING ELECTROKINETICALLY MANIPULATED SHEATH FLOW
 Z. Wang and D.J. Harrison
University of Alberta, CANADA

PERMEATION DRIVEN FLOWS IN PDMS MICROFLUIDIC DEVICES
 P. Doyle and G.C. Randall
Massachusetts Institute of Technology, USA

11:05 AM - 11:25 AM

USE OF SELF ASSEMBLED MAGNETIC PARTICLES FOR ON-CHIP PROTEIN DIGESTION
 A. Le Nel^{1,2}, N. Minc¹, M. Slovakova³,
 C. Smadja², J.-M. Peyrin², M. Taverna², and
 J.-L. Viovy¹
¹*Institut Curie, FRANCE*,
²*Université Paris XI, FRANCE*, and
³*University of Pardubice, CZECH REPUBLIC*

MICRO DISTILLATION SYSTEM ON CHIP UTILIZING SELECTIVE MODIFICATION GAS-LIQUID SEPARATOR AND CAPILLARY CONDENSATION IN NANOSTRUCTURE
 A. Hibara^{1,2,3}, K. Toshin¹, T. Tsukahara^{1,3},
 K. Mawatari^{2,3}, and T. Kitamori^{1,2,3}
¹*University of Tokyo, JAPAN*,
²*Kanagawa Academy of Science and Technology, JAPAN*, and
³*Japan Science and Technology Agency, JAPAN*

11:25 AM - 11:45 AM

A POLYMER-BASED MEMS SENSOR FOR BIOCALORIMETRIC MEASUREMENTS
 L. Wang and Q. Lin
Carnegie Mellon University, USA

TRANSPORTING MICROSCALE LOADS WITH MICROORGANISMS
 D.B. Weibel, P. Garstecki,
 D. Ryan, and G.M. Whitesides
Harvard University, USA

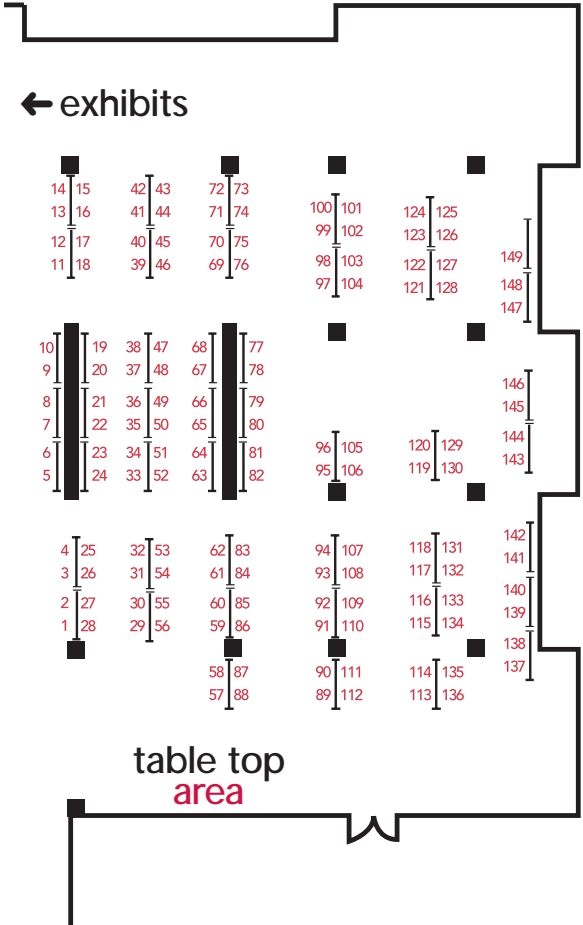
11:45 a.m.

| Conference adjourns



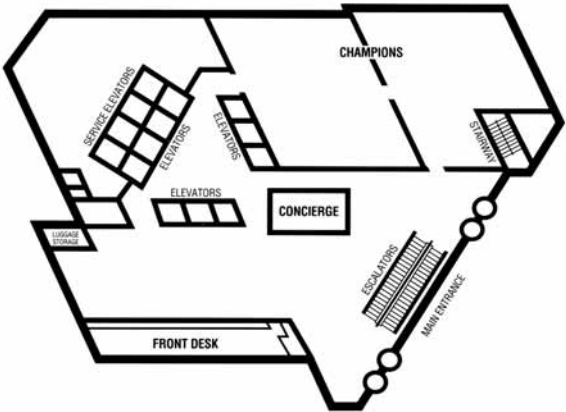
University of Massachusetts Hall

Third Floor

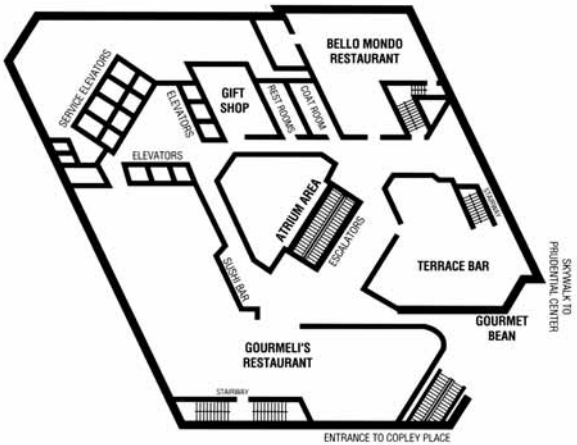




first floor

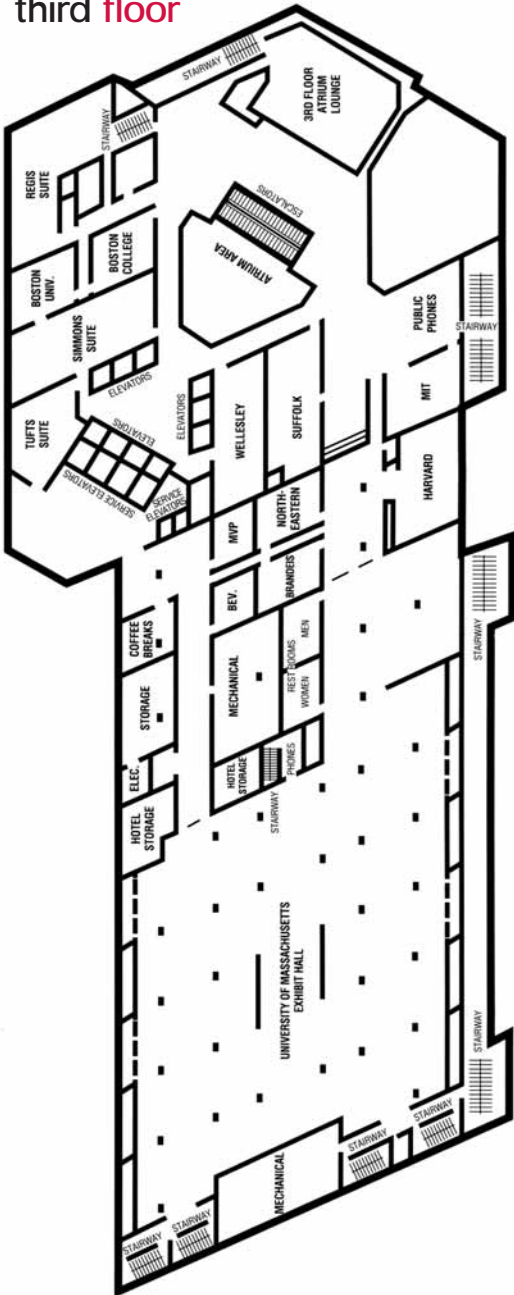


second floor

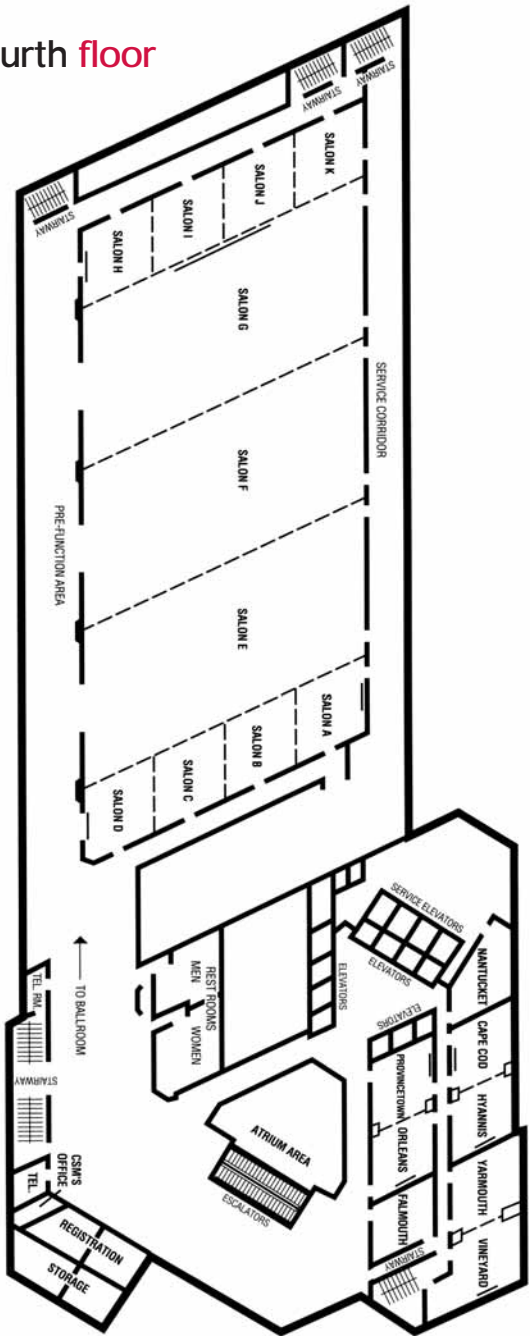




third floor



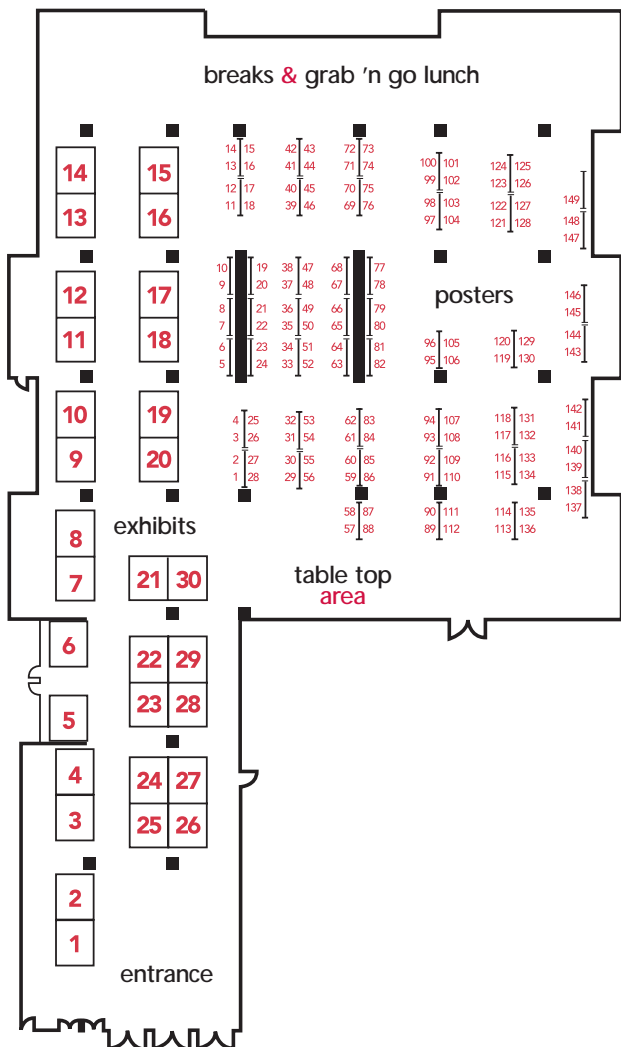
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CONFERENCE TOPICS

- Micro & Nano Fluidics
- Micro & Nano Fluidic Device
- Micro & Nano Fabrication
- Packaging & Interface
- System Technology
- Material & Surface
- Detection Technology
- Micro & Nano Chemistry
- Micro & Nano Biology
- Applications
 - Genomics & Proteomics
 - Medical & Clinical
 - Chemical Synthesis
 - Separation Science
 - Cell Handling & Analysis
 - Combinatorial Chemistry
 - Drug Discovery
 - Environmental
 - Others

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For further information about the conference, contact:
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April 15

June 9

August 1

Abstract Deadline

Author Notification

Manuscript Deadline

Sept. 30

Early Registration

Registration Deadline