

# LAB-ON-A-CHIP TECHNOLOGY

A major new two-volume work edited by **Keith E. Herold and Avraham Rasooly** and published by Caister Academic Press

## Volume 1: Fabrication and Microfluidics

Edited by: Keith E. Herold and Avraham Rasooly

xiv + 410 pp., August 2009 ISBN 978-1-904455-46-2 \$310/£150 Published by: Caister Academic Press

This comprehensive volume presents the current technologies in the field and includes theoretical and technical information to enable both the understanding of the technology and the reproduction of experiments. The book aims to help the reader to understand current LOC technologies, to perform similar experiments, to design new LOC systems and to develop new methodologies and applications. An essential book for biologists and clinicians using LOC technology and developing applications and also for engineering, chemical and physical science researchers developing analytical technologies. The book will also be useful as a teaching tool for bioengineering, biomedical engineering and biology.

**Contents:** • Fabricating PDMS Microfluidic Channels Using a Vinyl Sign Plotter *Michael Armani, Roland Probst and Benjamin Shapiro* • Functionalized Glass Coating for PDMS Microfluidic Devices *A.R. Abate, D. Lee, C. Holtze, A. Krummel, T. Do and David A. Weitz* • Fabrication of Lab-on-a-Chip Devices Using Microscale Plasma Activated Templating ( $\mu$ PLAT) *R. Carlson, S. Chao and J. Koschwanetz* • Bonding Techniques for Thermoplastic Microfluidics *Chia-Wen Tsao and Don L. DeVoe* • Xurography: Microfluidic Prototyping with a Cutting Plotter *Daniel A. Bartholomeusz, Ronald W. Boutt & Bruce K. Gale* • Silicon and Glass Micromachining *Edwin T. Carlen, Johan Bomer, Jan van Nieuwkastele and Albert van den Berg* • Flow Lithography for Fabrication of Multi-Component Biocompatible Microstructures *Yuk Kee Cheung, David Shiovtiz and Samuel K. Sia* • Microtechnology to Fabricate Lab-on-a-Chip for Biology Applications *Sang-Hoon Lee* • Cyclic Olefin Copolymer (COC) Polymer Molding for LOC *Dong Sung Kim and Kwang W. Oh* • Laminated Object Manufacturing (LOM) Technology Based Multi-Channel Lab-on-a-Chip for Enzymatic & Chemical Analysis *S. Sun, et al* • Laser Micromachining *Emanuel Waddell* • Shrinky-Dink Microfluidics *Anthony A. Grimes, Brent D. Rich, Maureen Long, Diep Nguyen and Michelle Khine* • Simple Recipe for Electroosmotic Mixing in Microchannels *Nadine Aubry* • Electrowetting-on-Dielectric (EWOD) Microfluidic Devices *Sang Kug Chung, Yuejun Zhao and Sung Kwon Cho* • Introduction to Electrokinetic Transport in Microfluidic Systems *David Erickson and Mekala Krishnan* • Frequency and Polarity Effects of Droplet-based LOC Driven by Electrowetting *Shih-Kang Fan* • Linear Dilution Microfluidic Devices *Adrian T. O'Neill and Glenn M. Walker* • Monolithic Membrane Valves and Pumps *William H. Grover and Richard A. Mathies* • An Active Micromixer Based on Non-equilibrium Electrokinetics for Lab-on-a-Chip Systems *Daejoong Kim* • Surface-Machined Parylene Microfluidics *Jason Shih, Terry D. Lee and Yu-Chong Tai* • Macro-to-Micro Fluidic Interfacing *Ronalee Lo and Ellis Meng* • Circular Ferrofluid-Driven PCR Microchips *Yi Sun, Yien Chian Kwok and Nam Trung Nguyen* • Injection Schemes for Microchip-based Analysis Systems *Michelle W. Li, Amanda L. Bowen, Nicholas G. Batz and R. Scott Martin*

## Volume 2: Biomolecular Separation and Analysis

Edited by: Keith E. Herold and Avraham Rasooly

xii + 300 pp., August 2009 ISBN 978-1-904455-47-9 \$310/£150 Published by: Caister Academic Press

The applications of LOC technology in the biomedical and life sciences. Various electrophoresis and liquid chromatography applications for proteins and DNA are described as well as methods for cell separation, with an emphasis on blood cell separation. Protein, genetic (mainly PCR) and transcriptome analysis are discussed in detail with examples from research and clinical applications, as well as cell manipulation including cell viability analysis and microorganism capturing. Of major value to a wide range of molecular biologists, clinical scientists, microbiologists, biochemists and anyone interested in LOC or developing applications for LOC devices.

**Contents:** • Two-Dimensional Electrophoresis in a Chip *Z. Hugh Fan, Champak Das and Hong Chen* • Liquid Chromatography in Microfluidic Chips *Hernan V. Fuentes and Adam T. Woolley* • Design and Fabrication of Microfluidic Devices for Flow-based Separation of Blood Cells *Lance L. Munn and A. Jain* • Hydrophoretic Method for Continuous Blood Cell Separation *Sungyoung Choi and Je-Kyun Park* • Microchip Gel Electrophoresis of DNA with Integrated Whole-column Detection *Roger C. Lo and Victor M. Ugaz* • Microscale Blood Separation Technology *Jeffrey D. Zahn, Sung Yang, Akif Undar and Pantelis Athanasiou* • Microfluidic Drops as Microreactors *Charles N. Baroud* • Optical Sectioning for Microfluidics *Yeh-Chan Ahn and Zhongping Chen* • Acquisition of Single Cell Data in an Optical Microscope *Kristin Sott, Emma Eriksson and Mattias Goksör* • Elaborating Lab-on-a-ChipS for Single-cell Transcriptome Analysis *N. Bontoux, Luce Dauphinot and Marie-Claude Potier* • Integrated Circuit/Microfluidic Chips for Dielectric Manipulation *T.P. Hunt, D. Issadore, K.A. Brown, H. Lee and R.M. Westervelt* • Microchip-based PCR Amplification Systems *Nathanial C. Cady* • Cell Viability Measurement Using a Portable Photodiode Array Chip *Joon Myong Song and Ho Taik Kwo* • A Charge-coupled Device (CCD) Based Optical Detector for Lab-on-a-Chip *Keith Herold and Avraham Rasooly* • PCR Devices Using Glass Substrate *Hao Yu, Jianhua Qin and Bingcheng Lin* • Braille Microfluidics *Tommaso F. Bersano-Begey, Yoko Kamotani and Shuichi Takayama* • Microfluidic Devices for Single-cell Analysis *Yan Chen and Jiang F. Zhong*

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