

Microchip-Based Assay Systems

Methods and Applications

Edited by

Pierre N. Floriano

University of Texas at Austin, Austin, TX

Microchip-Based Assay Systems explores recent progress in the microelectronics arena, the resultant miniaturization of component device features to nanometer size particles, and the ensuing growth in the development and use of microchip-based techniques in leading laboratories around the world. While the area of microelectronics faces daunting challenges, the field also promises fascinating new advances that may translate into products such as sensors and devices that use nanometer-sized building blocks for real-world applications. The contributors to this volume are part of growing interdisciplinary efforts among pioneers in microelectronics, nanoscience, and health that will continue to create exciting new microchip-based applications across a variety of sectors. In the 16 chapters of this volume, leading scientists present technically precise microchip-based assays for a variety of applications. The protocols detailed in this volume will help foster interest in microchip-based assays by providing readers with all the tools necessary to create their own microchip-based assays targeted to new applications. Certainly, this compilation of methods and protocols will help to expand the scope and accelerate the transition of microchip-based assays from academic and industrial research and development centers to real-world use.

FEATURES

- DNA microchips for diagnosis and molecular signatures in cervical cancer
- Cutting-edge microarray applications
- Integrated protocols utilizing microfluidic chips, devices, and 3-D networks
- Identification of protein-protein interactions in an array format
- Methods for the detection of HIV RNA interactions with peptides
- Microchip-based electrochemical enzyme immunoassays

CONTENTS

Microchip Electrophoresis for DNA Separation by Wire-Imprinted Microchannels on PMMA Substrates. Fabrication of Porous Polymer Monoliths in Microfluidic Chips for Selective Nucleic Acid Concentration and Purification. Rapid Electrical Lysis of Bacterial Cells in a Microfluidic Device. On-Chip Bioassay Using Immobilized Sensing Bacteria in Three-Dimensional Microfluidic Network. Microchip-Based Enumeration of Human White Blood Cells. Microchip for the Diagnosis of Cervical Cancer. DNA Microchips Toward Molecular Signatures in Cervical Cancers. Impedimetric Detection for DNA Hybridization Within Microfluidic Biochips. Applications of Functional Protein Microarrays: *Identifying Protein-Protein Interactions in an Array Format. A*

Microchip-Based Assay for Interleukin-6. Allergen Microarrays for the Diagnosis of Specific IgE Against Components of Cow Milk and Hen Egg in a Multiplex Biochip-Based Immunoassay. Surface Plasmon Resonance Imaging on Polypyrrole Protein Chips: Application to Streptavidin Immobilization and Immunodetection. Protein Array-Based Multiplexed Cytokine Assays. Lectin Microarrays for Glycoprotein Analysis. Interaction of HIV RNA With Peptides Detected by Acoustic Shear Wave Sensor Operated in an On-Line Format. Microchip-Based Electrochemical Enzyme Immunoassays. Index.

Methods in Molecular Biology™ • 385
MICROCHIP-BASED ASSAY SYSTEMS
 METHODS AND APPLICATIONS
 ISBN: 978-1-58829-588-0
 E-ISBN: 978-1-59745-426-1
 ISSN: 1064-3745
humanapress.com

ISBN 978-1-58829-588-0

