



Microfluidic Technologies for Human Health (The field of microfluidics has in the last decade permeated many disciplines, from physics to biology and chemistry, ... of microfluidic-mediated diagnostics.)

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The field of microfluidics has in the last decade permeated many disciplines, from physics to biology and chemistry, and from bioengineering to medical research. One of the most important applications of lab-on-a-chip devices in medicine and related disciplines is disease diagnostics, which involves steps from biological sample/analyte loading to storage, detection, and analysis. The chapters collected in this book detail recent advances in these processes using microfluidic devices and systems. The reviews of portable devices for diagnostic purposes are likely to evoke interest and raise new research questions in interdisciplinary fields (e.g., efficient MEMS/microfluidic engineering driven by biological and medical applications).

The variety of the selected topics (general relevance of microfluidics in medical and bioengineering research, fabrication, advances in on-chip sample detection and analysis, and specific disease models) ensures that each of them can be viewed in the larger context of microfluidic-mediated diagnostics.

Contents:

- A Microscale Bioinspired Cochlear-like Sensor (*Robert D White, Robert Littrell, and Karl Grosh*)
- Systematic Evaluation of the Efficiencies of Proteins and Chemicals in Pharmaceutical Applications (*Morgan Hamon and Jong Wook Hong*)
- Microfluidic Glucose Sensors (*Jithesh V Veetil, Sruthi Ravindranathan, Sha Jin, and Kaiming Ye*)
- Applications of Microfabrication and Microfluidic Techniques in Mesenchymal Stem Cell Research (*Abhijit Majumder, Jyotsna Dhawan, Oren Levy, and Jeffrey M Karp*)
- Patient-Specific Modeling of Low-Density Lipoprotein Transport in Coronary Arteries (*Ufuk Olgac*)
- Point-of-Care Microdevices for Global Health Diagnostics of Infectious Diseases (*Sau Yin Chin, Tassaneewan Laksanasopin, Curtis D Chin, and Samuel K Sia*)
- Integrated Microfluidic Sample Preparation for Chip-based Molecular Diagnostics (*Jane Y Zhang, Qingqing Cao, Madhumita Mahalanabis, and Catherine Klapperich*)
- Microfluidic Devices for Cellular Proteomic Studies (*Yihong Zhan and Chang Lu*)
- Microfluidics for Neuroscience: Novel Tools and Future Implications (*Vivian M Hernandez and P Hande Özdinler*)
- Microfluidics: On-Chip Platforms as *In Vitro* Disease Models (*Shan Gao, Erkin ?eker, and Martin L Yarmush*)
- Application of Microfluidics in Stem Cell and Tissue Engineering (*Sasha H Bakhru, Christopher Highley, and Stefan Zappe*)
- Microfluidic “On-the-Fly” Fabrication of Microstructures for Biomedical Applications (*Edward Kang, Sau Fung Wong, and Sang-Hoon Lee*)
- Microfluidics as a Promising Tool Toward Distributed Viral Detection (*Elodie Sollier and Dino Di Carlo*)
- Electrophoresis and Dielectrophoresis for Lab-on-a-Chip (LOC) Analyses (*Ya?mur Demircan, Gürkan*)

Yilmaz, and Haluk Külah)

- Ultrasonic Embossing of Carbon Nanotubes for the Fabrication of Polymer Microfluidic Chips for DNA Sample Purification (*Puttachat Khuntontong, Min Gong, and Zhiping Wang*)
- Ferrofluidics (*A Rezzan Kose and Hur Koser*)
- Antibody-based Blood Bioparticle Capture and Separation Using Microfluidics for Global Health (*ZhengYuan Luo, ShuQi Wang, Utkan Demirci, TianJian Lu, Feng Xu, and BoFeng Bai*)
- Applications of Quantum Dots for Fluorescence Imaging in Biomedical Research (*ShuQi Wang, Martin Esfahani, Dusan Sarenac, Bettina Cheung, Aishwarya Vasudevan, Fatih Inci, and Utkan Demirci*)

Readership: Engineers, academic researchers and instructors, and industry researchers involved in microfluidic technologies.

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