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"*Due to the multidisciplinary nature of microfluidics and bio-microelectromechanical systems (bio-MEMS), it is challenging to handle this topic. Instead of trying to fully cover the field of microfluidics, this book focuses on several interesting directions with in-depth analysis and discussion. I strongly recommend this book for graduate-level courses where students with a preliminary background of bio-MEMS can utilize it to conduct case studies to deepen their understanding and enrich their experience of microfluidics.*"

Prof. Jian Chen
Chinese Academy of Sciences, China

"*Dr. Santra's book on microfluidics and bio-MEMS gives a basic introduction to bio-MEMS and covers a wide range of applications. It is illustrated with over 180 figures and describes key concepts intuitively. Major studies published in the 2010s can be grasped concisely.*"

Prof. Moeto Nagai
Toyohashi University of Technology, Japan

The past two decades have seen rapid development of micro-/nanotechnologies with the integration of chemical engineering, biomedical engineering, chemistry, and life sciences to form bio-MEMS or lab-on-chip devices that help us perform cellular analysis in a complex micro-/nanoflluidic environment with minimum sample consumption and have potential biomedical applications. To date, few books have been published in this field, and researchers are unable to find specialized content. This book compiles cutting-edge research on cell manipulation, separation, and analysis using microfluidics and bio-MEMS devices. It illustrates the use of micro-robots for biomedical applications, vascularized microfluidic organs-on-a-chip and their applications, as well as DNA gene microarray biochips and their applications. In addition, it elaborates on neuronal cell activity in microfluidic compartments, microvasculature and microarray gene patterning, different physical methods for drug delivery and analysis, micro-/nanoparticle preparation and separation in a micro-/nanofluidic environment, and the potential biomedical applications of micro-/nanoparticles. This book can be used by academic researchers, especially those involved in biomicrofluidics and bio-MEMS, and undergraduate- and graduate-level students of bio-MEMS/bio-nanoelectromechanical systems (bio-NEMS), biomicrofluidics, biomicrofabricatios, micro-/nanofluidics, biophysics, single-cell analysis, bionanotechnology, drug delivery systems, and biomedical micro-/nanodevices. Readers can gain knowledge of different aspects of microfluidics and bio-MEMS devices; their design, fabrication, and integration; and biomedical applications. The book will also help biotechnology-based industries, where research and development is ongoing in cell-based analysis, diagnosis, and drug screening.

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