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Sommario/riassunto

"As technological advancements widen the scope of applications for biomicroelectromechanical systems (BioMEMS or biomicrosystems), the field continues to have an impact on many aspects of life science operations and functionalities. Because BioMEMS research and development require the input of experts who use different technical languages and come from varying disciplines and backgrounds, scientists and students can avoid potential difficulties in communication and understanding only if they possess a skill set and understanding that enables them to work at the interface of engineering and biosciences. Keeping this duality in mind throughout, BioMEMS: Science and Engineering Perspectives supports and expedites the multidisciplinary learning involved in the development of biomicrosystems. Divided into nine chapters, it starts with a balanced introduction of biological, engineering, application, and commercialization aspects of the field. With a focus on molecules of biological interest, the book explores the building blocks of cells and viruses, as well as molecules that form the self-assembled monolayers (SAMs), linkers, and hydrogels used for making different surfaces biocompatible through functionalization. The book also discusses: Different materials and platforms used to develop biomicrosystems Various biological entities and pathogens (in ascending order of complexity) The multidisciplinary aspects of engineering bioactive surfaces Engineering perspectives, including methods of manufacturing bioactive surfaces and devices Microfluidics modeling and experimentation Device level implementation of BioMEMS concepts for different applications. Because BioMEMS is an application-driven field, the book also highlights the concepts of lab-on-a-chip (LOC) and

micro total analysis system (oTAS), along with their pertinence to the emerging point-of-care (POC) and point-of-need (PON) applications"--
Provided by publisher.

"Preface We are proud to present this book as an attempt to bridge different areas that constitute the field of biomicroelectromechanical systems (BioMEMS), often called biomicrosystems. The field of BioMEMS has been growing rapidly since the early 1990s due to the advancements in microtechnologies that could cater to the vast application requirements of bio areas. The potential of BioMEMS suits this technology for many applications, including clinical and environmental diagnostics, drug delivery, agriculture, nutrition, pharmaceuticals, chemical synthesis, etc. It is foreseen that BioMEMS will have a deep impact on many aspects of the life science operations and functionalities in the near future. Scientists and students that work in the field of BioMEMS will need to have knowledge and skills at the interface between engineering and biosciences. Development of a BioMEMS device usually involves many scientists and students from various disciplines, such as biosciences, medicine, biochemistry, engineering, physics, etc. One could anticipate many communication and understanding issues that would arise among these people with varied expertise and training. The methods, details, and languages of training are quite different for the students and researchers of engineering and biosciences. As a result, researchers and students involved with multidisciplinary projects like BioMEMS undergo an interesting and refreshing learning on multidisciplinary subjects along the project development. This book aims to support and expedite the multidisciplinary learning involved with the development of biomicrosystems, from both bioscience and engineering perspectives"--
--Provided by publisher.
