

# **Nanofiber Composites for Biomedical Applications**

**Edited by  
Murugan Ramalingam and Seeram Ramakrishna**



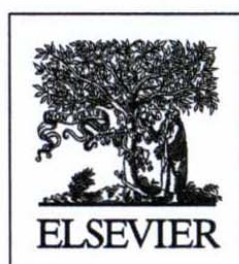
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***Murugan Ramalingam***

***Seeram Ramakrishna***



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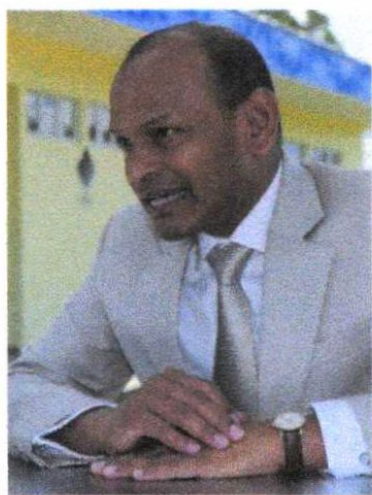
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# Preface

Nanofibers have found widespread application in the biomedical field. To advance the usage and functionality of nanofibers, the concept of nanofiber composites has been introduced. Nanofiber composites have been developed extremely rapidly during the last few years, owing to the unique functional properties with which they are endowed and the fact that they often tend to perform better than their individual components. The unique characteristics of nanofiber composites, along with their remarkable suitability for surface modification and excellent mechanical performance, makes possible their use in a wide range of biomedical applications. The main objective and the essence of this book is therefore to present the new developments and impacts of nanofiber composites in various biomedical applications.

This book consists of 20 chapters, which are grouped into 4 parts. Part I (chapter: Introduction to nanofiber composites) deals with an introduction to nanofiber composites. Part II (chapters: Ceramic nanofiber composites; Polymer nanofiber composites; Metallic nanofiber composites) describes the classification of nanofiber composites. Here, the nanofiber composites are classified into three types: ceramic, polymeric, and metallic nanofiber composites. Part III (chapters: Physicochemical characterization of nanofiber composites; Mechanical characterization of nanofiber composites; Biological characterization of nanofiber composites) deals with the properties of nanofiber composites, wherein physicochemical, mechanical, and biological properties are focused upon. Part IV (chapters: Polymer nanofiber composites in drug delivery; Nanofiber composites in biomolecular delivery; Nanofiber composites for gene delivery; Nanofiber composites in skin tissue engineering; Nanofiber composites in bone tissue engineering; Nanofiber composites in cartilage tissue engineering; Nanofiber composites in tendon tissue engineering; Nanofibers in skeletal muscle tissue engineering; Nanofiber composites in neural tissue engineering; Nanofiber composites in cardiac tissue engineering; Nanofiber composites in vascular tissue engineering; Nanofiber composites in blood vessel tissue engineering; Clinical/preclinical aspects of nanofiber composites) highlights the biomedical applications of nanofiber composites, wherein key applications of drug delivery, biomolecular delivery, gene delivery, tissue engineering, and regenerative medicine are discussed.

This fascinating book features contributions from very experienced authors who are leaders in their fields. We, the Editors, sincerely hope that the information in this book will be a valuable resource for a wide audience, including graduate students, researchers, professors, scientists, bioengineers, clinicians, and industrial experts working in the field of nanofiber composites, nanobiotechnology, biomaterials, stem cells, drug delivery, tissue engineering, and regenerative medicine.

Murugan Ramalingam  
Seeram Ramakrishna



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