Preface

The use of biomaterials has substantially increased in the last decades. This occurs due to population aging, life expectancy increasing and lifestyle, and implants technology improvements. The development of biomaterials with necessary characteristics to aid in tissue recovery caused by accident or disease is one of the biggest challenges in the scientific field, which involves biomedical and engineering areas. The most important factor that differentiates a biomaterial of other material is the ability to be in contact with human body tissues without causing damages of unacceptable magnitude. The biomaterial must be biocompatible, biofunctional, inert, and sterilizable. They are classified according to their chemical nature, as metal, ceramic, polymeric, and composites. Metallic materials are used because of their good mechanical strength properties, high toughness, easy manufacture, and low cost. Ceramic materials have low electrical and thermal conductivity and exhibit good chemical stability. Polymeric materials are used because of physico-chemical characteristics and structural versatility. Composite materials are used because of specific properties obtained only when different types of materials are combined.

This book contains an updated overview of Engineering of Biomaterials. Its content includes case studies of application of biomaterials and provides in a clear and objective manner a context of biomaterials within areas of knowledge like medicine, physiotherapy, biology, chemistry, materials science, chemical engineering, and mechanical engineering. The authors have practical experience with manufacturing processes of metal, polymer, and ceramic artifacts, degradation of polymeric materials in vitro tests and sterilization processes. This book is addressed to students, researchers, doctors, physiotherapists, and engineers who search for a deeper general knowledge in biomaterials. I am sure that the clear language and the application-oriented perspective of this book will widely satisfy the readers' exigencies.

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