

Preface

Life is a perfect equilibrium between mind and body. It is a whole of different variables that, during our life we have to set up. In this challenge the safe maintenance of the human body represents one of our most important goal. In this sense, science and technology play a key role in the extended life expectancy. In the last century and especially in the last years, the medical area, in order to afford the new challenge in health care, was subject to necessary and deep changes (improvements), thanks also to a cross-fertilization of several disciplines.

Surgery, for example, has developed with a wide range of innovative techniques and new devices (implants and surgical instruments) resulting in a reduction of morbidity and mortality.

The use of drug delivery systems to improve the efficacy of bioactive molecules remains an important strategy for achieving progress against the disease and progress in this field has been remarkable. Over the past 20 years, the number of novel therapeutic approaches has expanded from traditional small chemical medicinals to a wide variety of biomolecules, including peptide/protein- and nucleic acid-based therapeutics. All of these therapies require the administration of stable dosage forms in adequate concentrations and exposure periods with the aim to realize their potential.

At the same time new medical categories are widely expanded: tissue engineering has made great strides in the replacement of worn out organs and tissues due to disease, injury, etc. in order to have real efficiency and efficacy, medical therapy needs efficient and effective biomaterials both for intra and extracorporeal treatments.

Biomaterials and in particular polymeric ones are the focus of this scientific revolution and represent one of the major researches around the world.

One of the reasons for the great popularity in the use of polymers in medicine is that their properties can be tailored to meet specific needs by varying the “atomic composition” of the repeat structure, molecular weight, or performing chemical modifications of natural polymers.

The rationale of this contributed book stems from the premise to have an important instrument that can be a knowledge bridge between teaching experience and scientific research.

This idea represents a true answer to the natural question: What is the novelty in *Advanced Polymers in Medicine*? The first part of the book reviews the relevant background information on polymer chemistry and the physicochemical characterization and represents the scientific support for the following chapters. The second part is devoted to a complete overview of “Medically” oriented polymers and every chapter is dedicated to a medical specialty. In my opinion, this type of approach will provide a better overview of polymers and medical applications and allows an effective use both for teaching that scientific reference book. Therefore, this book is intended for students and researchers who work in the area of biomaterials. I am conscious that a successful book is a product of several integrated expertises; in this contributed volume, many of these were given by contributing authors, all of which are listed in the bibliography. Thank you!

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