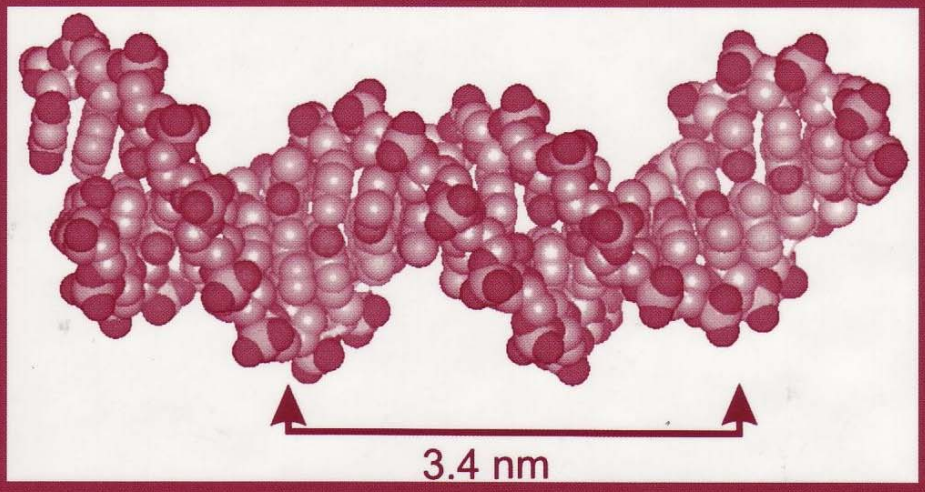
BIOMATERIALS *for* DELIVERY *and* TARGETING *of* PROTEINS *and* NUCLEIC ACIDS

EDITED BY
Ram I. Mahato



CRC PRESS

Preface

Progress in biotechnology has created many opportunities for the development of protein- and nucleic acid-based therapeutics for the treatment of genetic and acquired diseases. There are numerous advanced books on polymer synthesis, drug delivery, oligonucleotides, and gene therapy, but there is an urgent need for a textbook for newcomers to this field including graduate students and young scientists, who have little understanding of the field. This book is expected to serve as a textbook and/or reference text for graduate courses in biomaterials and delivery of proteins and nucleic acids.

Among scientists with different expertise, effective protein and nucleic acid-based therapeutics require a multi-disciplinary approach, such as molecular and cell biology, biochemistry, biophysics, polymer chemistry, colloid science, pharmaceutics, and medicine. Significant progress has been made in the use of biomaterials and polymeric carriers for the delivery of proteins, peptides, and nucleic acids (including plasmid DNA, antisense and antigene oligonucleotides, and siRNA). In addition to their use as carriers, polymers are finding increased use in polymer therapeutics, whereby the conjugated polymeric carriers usefully alter the properties of the protein or the nucleic acid. Liposomes have also been proven useful for delivery of proteins and nucleic acids. With this end in mind, I have organized this book to reflect various aspects of the field namely:

- Use of polymers —structure, properties, synthesis and characterization
- Crosslinking and PEGylation of proteins
- Biocompatibility and biological barriers
- In vivo and subcellular fate
- Stability and formulation aspects of proteins and nucleic acids
- Micro- and nano-particulate and liposomal delivery systems
- Drug resistance and transporters
- Protein transduction domain peptides
- Antisense and antigene approaches
- Artificial nucleic acid chaperones
- Basic elements of nonviral gene therapy

This book is written by international experts and leaders in their respective fields of knowledge. We have attempted to convey both an introductory understanding as well as latest developments in the field so that this book will be useful for both novice students and practicing scientists. We hope that this book will stimulate deeper understanding and interest in this integrated field, from people with diverse expertise and backgrounds.