RECENT ADVANCES IN NOVEL DRUG CARRIER SYSTEMS

Edited by **Ali Demir Sezer**

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Preface

Drug delivery is a method or process of administering a pharmaceutical compound to achieve a therapeutic effect in humans or animals. Drug delivery technologies modify drug release profile, absorption, distribution and elimination for the benefit of improving product efficacy and safety, as well as patient convenience and compliance. Drug release comes from diffusion, degradation, swelling, and affinity-based mechanisms. Most common routes of administration include the preferred non-invasive peroral, topical, transmucosal and inhalation routes. Many medications such as peptide and protein, antibody, vaccine and gene based drugs, in general may not be delivered using these routes.

However, for all these exciting new drug and vaccine candidates, it is necessary to develop suitable dosage forms or drug delivery systems to allow the effective, safe and reliable application of these bioactive compounds to the patient. In the view of most experts pharmacology is on drugs, targets, and actions. In the context, the drug as a rule is seen as an active pharmaceutical ingredient and not as a complex mixture of chemical entities of a well defined structure. Today, we are becoming more and more aware of the fact that delivery of the active compound to the target site is a key. The present volume gives a topical overview on various modern approaches to drug delivery and targeting on covering today's options for specific carrier systems allowing successful drug treatment at various sites of the body that are difficult to address and allowing to increase the benefit-risk-ratio to the optimum.

On the other hand, the reader will be introduced to various aspects of the fundamentals of nanotechnology based drug delivery systems and the application of these systems for the delivery of small molecules, proteins, peptides, oligonucleotides and genes. How these systems overcome challenges offered by biological barriers to drug absorption and drug targeting will also be described.

The aim of this book was to gather all results coming from very fundamental studies. Again, this allows to gain a more general view of the various drug carrier systems and can prepare and apply, along with the methodologies necessary to design, develop and characterize them.

It is critical for the field of drug delivery from a proof of concept to a pharmaceutical product at the beginning of the new millennium. A successful outcome will result in a new clinical modality that represents a revolutionary approach to medicine. One immediate benefit will be to produce a continuous level of therapeutic protein, avoiding the characteristic peak and trough behavior of intermittent administrations with drug carrier systems. Novel drug delivery carriers will have the capability to turn genes on or off on demand, producing a therapy that can treat the disease rather than the symptoms and with minimal side effects.

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