



Contents lists available at ScienceDirect

European Journal of Pharmaceutics and Biopharmaceutics

journal homepage: www.elsevier.com/locate/ejpb

Book review

R.O. Williams III, D.R. Taft, J.T. McConville (Eds.), *Advanced Drug Formulation Design to Optimize Therapeutic Options*, Informa Healthcare, 536 pp, € 178, ISBN: 978-1-4200-4387-7.

This latest book from the Series "Drugs and the Pharmaceutical Sciences" illustrates how advanced formulation and delivery technologies may improve drug efficacy and treatment outcomes in particular therapeutic situations. Such novel delivery technologies become more and more interesting for the pharmaceutical industry, as they offer numerous advantages over conventional dosage forms. They may control drug release to give a sustained therapeutic effect, improve drug potency and in parallel decrease toxic side effects, target a drug specifically to a desired location in the body and finally, they may provide greater safety to the patient. In addition, an increasing number of expiring patents and stricter regulatory control has lead companies to reconsider the design of existing products. There are many methods of drug delivery available requiring a variety of formulation options. New possibilities to improve the efficacy of existing drug products to both extend patent life and allow competition with generic companies allows for a greater understanding of formulation design.

The book introduces the reader to different cutting edge areas of formulation design and advanced technologies by providing background information to various diseases states and then leading him through different therapeutic strategies and discussing clinical outcomes. The first four chapters of the book deal with pulmonary drug delivery starting with an overview about recent advances in dry powder and liquid-propellant technologies. This introduction is followed by a discussion of novel strategies to overcome invasive pulmonary aspergillosis and the pulmonary delivery of anti-cancer agents. A relatively complex chapter is devoted to inhalative insuline, where technologies, safety aspects and clinical outcomes of different systems as discussed such as the Exubera system, AERx system, AIR system, Technosphere/Insuline or Spiros. Here the book is not really up-to date as the withdrawal of the Exubera system from the market at the end of 2007 is not mentioned.

In Chapter 5, the reader finds out, how ophthalmic infections can be treated and how optimized formulation approaches improve the therapeutic outcome. Chapter 6 provides an overview of emerging approaches in cancer chemotherapy starting with a review of various obstacles (physiological, physicochemical, pharmacokinetic) that must be overcome and then presenting drug delivery strategies, that have been devised to breach these barriers. Several examples are demonstrated, where novel delivery systems optimize the therapeutic outcome of cancer treatment. The chapter closes with an outlook over challenges that remain and opportunities that exist for further developments. Chapter 7 describes current therapeutic

options to treat infections in the gastrointestinal tract, the use of advanced therapeutic options as well as their future perspectives.

Controlled drug delivery to the brain is the topic of Chapter 8. The treatment of brain diseases is particularly challenging due to the tight blood-brain barrier, which separates CNS and blood circulation. Whereas the permeation across this barrier is only briefly mentioned, the main focus of the chapter is set on description of direct drug administration into the brain, e.g. by polymeric implants, microparticles or the use of controlled release microchip technologies. Chapter 9 introduces the reader to nasal delivery systems that can be used for a variety of diseases and discusses an advanced formulation design of nasal inserts.

Chapter 10 again focuses on the brain and gives a very good overview the blood-brain barrier physiology and approaches to overcome this barrier. It clearly states, that there is sufficient knowledge what the potential therapeutic options for various CNS diseases are, but that we are presently unable to deliver them. Chapter 11 describes therapeutic options for cardiovascular drug delivery and Chapter 12 discusses novel achievements in immunosuppressive therapies, where recent advancements in drug delivery resulted in optimized therapeutic results.

Peroral drug administration by use of solid dispersion is the topic of the final chapter. Although this route of administration is preferred, it can be problematic for many drugs due to instability or poor bioavailability. The chapter gives a wide-spanned overview about the use of solid dispersions in order to improve dissolution properties and as a consequence the bioavailability of different drugs in various indications.

The book has been written by experts in the field and gives an up-to-date overview about the respective delivery technologies. Particularly, the connective discussion of these technologies with pharmacokinetic and clinical data has been handled excellently. The chapters are very well illustrated and supplemented by a comprehensive list of the current literature. Thus, the book offers only few weaknesses: Considering the exceeding width and the complexity of novel drug delivery technologies, it becomes obvious that not each aspect can be discussed with the same detailedness. For example, microemulsions, targeted liposomes or solid lipid nanoparticles are only briefly discussed in between, mucoadhesive systems are not mentioned at all. Nevertheless, the book presents a condensed overview about the most important areas of therapy, where advanced formulation design offers significant improvement in clinical outcomes to the benefit of patients, and therefore its content also copes with its relatively high price.

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Available online 29 December 2008