ELSEVIER

International Journal of Pharmaceutics 220 (2001) 179–180

international journal of pharmaceutics

www.elsevier.com/locate/ijpharm

Book review

***Handbook of pharmaceutical controlled release technology*, Edited by Donald L. Wise; ISBN Number: 0-8247-0369-3**

This 890-page text reviews the technology underpinning controlled delivery dosage forms and will be of great benefit to industrial formulators looking for ideas on how best to tailor drug bioavailability. Other users seeking methods of controlling availability, such as in the application of pesticides or in industrial processing may also find the book useful.

The volume starts with a section on the chemistry governing controlled delivery technology and ends with a few examples of the application of these technologies. The text tells us that there are two ways of controlling drug delivery, namely by limiting drug diffusion which is achieved by trapping the drug in various polymeric matrices or by using external or internal stimuli to effect drug delivery. The most common form of achieving sustained release over days, weeks or months is undoubtedly the former and chapter on chapter describes how this may be achieved by using a variety of polymers to fabricate compressed tablets, chemically/physically cross-linked gels, microparticles and nanoparticles. A smaller proportion of the book is dedicated to controlling delivery by applying external stimuli to a device, tablet or particle. These include the alteration of pH or temperature or alternatively the application of an electric current, magnetic field, ultrasound or enzymes. Details on controlling release by using internal stimuli are limited mainly to effecting delivery by engineering alterations in osmotic pressure. Controlling delivery by exploiting osmotic pressure has actually progressed through a great deal of biological testing and as such two chapters are devoted to this topic, with much space being given to descriptions of the Alzet pump, Duros implant and membrane film-coated osmotically driven particles.

Most of the polymers described in the text are familiar names such as polylactic acid co-glycolic acid, polyvinylalchohol and the substituted celluloses. Polylactic acid co-glycolic acid crops up in a number of chapters, an exemplification of the fact that there is a need to synthesise specially tailored polymers for various applications especially if new responsive systems are to be developed. Although the majority of the book's chapters deal with the characterisation of the individual polymer matrices discussed, a chapter on physical characterisation techniques alone gives account of the use of infrared and Raman spectroscopy to characterise hydrogels. There is also extensive mathematical modelling of drug release from the various polymer matrices in the text as a whole. A treatment of the biological characterisation of such controlled release systems, apart from that mentioned above on osmotically driven devices/particles, includes details on the evaluation of gastro-retentive systems, the use of gamma scintigraphy to track the path of dosage forms on oral administration and measurements of the efficacy of certain dosage forms in animal models. Information on the development of specific formulations is presented and these include controlled release formulations of nesterone for fertility control, hydromorphone for pain relief and buprenorphine for the treatment of addiction. Incidentally, in the preface the editor points out that the area of

PII: S0378-5173(01)00652-4

narcotic addiction was one of the first areas for which controlled release technology was developed. Other areas where it was thought that these systems could be applied, back in the 1970s when the science was in its infancy, included malaria prophylaxis and fertility control. A section of the book is devoted to a treatment of the development of protein and peptide controlled release because of the labile nature of these materials. There is also an interesting chapter on the economic benefits of designing these technologically complex systems. The point is well made in this chapter on pharmacoeconomics that clinical benefit should be the primary consideration in any cost–benefit analysis. The text provides a detailed treatment of these emerging technologies in one handy volume and is a recommended reference text for the pharmaceutical industry.

I. Uchegbu
Department of Pharmaceutical Sciences,
University of Strathclyde,
Royal College,
George St.,
Glasgow G1 1XW,
UK