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Book Review

Nanoparticulate Drug Delivery Systems. D. Thassu, M. Deleers, and Y. Pathak, (Eds.). Informa Healthcare, 2007, Hardcover, 352 pp. ISBN-13: 978-0-8493-9073-9.

A large part of the appeal of nanotechnology in general, and of this text in particular, is the tremendous breadth of technologies embraced. Not only are classic drug delivery systems included, but also novel and futuristic systems crossing into the realms of physics, electrical engineering, and electronics. These delicious 352 pages, plus 8 pages of color figures, explore the latest developments in particulate drug delivery using familiar technologies such as liposomes and polymeric micelles all the way through to nanoengineered prosthetic devices, electrospun nanofibers, and nanocontainers for detection and destruction of tumors.

What are nanoparticulate systems, and how do they differ from other types of drug delivery systems in their applications in the development of new drugs and the search for new cures and uses for old drugs? After all, a wide variety of drug delivery systems have been available for decades in pharmaceutical development. Some are now marketed products, for example Doxil, and the controversial Abraxane. The novelty of nanoparticulate systems lies in both engineering and manufacturing advances, solutions to development challenges (e.g., product safety, stability), and the therapeutic opportunities created, such as unique penetration properties with targeted toxicity to disease sites.

The prefix "nano-" comes from the Greek word for dwarf. As elaborated in the opening chapter, particulates in the range of 100 nm, down to the atomic level of around 0.2 nm, are creating so much excitement because this is the range in which materials can have different and medically enhanced properties compared with the same material of a larger size. However, this book by no means confines itself to the <100-nm size range. With good reason, there are many references to previous studies in the field that may use larger particulate systems, and to systems in this size range that have been providing extraordinary biomedical solutions long before the term "nanotechnology" became a buzz word. This text greatly benefits from descriptions of current discoveries and ideas in the context of a rich history of drug delivery research, such as in vivo fate and behavior of particulate carriers across a spectrum of sizes.

One of the joys of an edited collection such as this is the range of styles and talents of the authors. Repetition and uneven writing quality in some of the chapters notwithstanding, the editors are to be congratulated on the diversity of backgrounds and approaches of the authors. The balance between continents, academia, and industry gives this work a truly global perspective. Indeed, it is well worth reading everything in this book. By relying on the chapter headings alone, one might miss some hidden gems. For example, a personal favorite was the section on tumor angiogenesis and vascularization in a chapter on biological and engineering considerations.

This text offers a dazzling overview of nanoparticulate systems for people with any level of knowledge of drug delivery applications and technology. Anyone involved in pharmaceutical product development, drug formulation, drug delivery, bioengineering, medicine, preclinical studies, regulatory sciences, and the like will find much value in exploring the fascinating science and engineering issues that nanotechnology addresses. Or, simply enjoy the "It's a Small World" feeling of boldly going deep into the physiology of the body in a "nanocontainer."

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