

## Book review

**Pharmaceutical Experimental Design (Drugs and the Pharmaceutical Sciences, Vol. 92), Edited by G.A. Lewis, D. Mathieu and R. Phan-Tan-Luu, 1st Edition, Marcel Dekker, New York, 1999. vi + 498 pp., 23.5 × 15.5 cm., 1.9 lb., Hardcover, ISBN 0-8247-9860-0, Price \$175.00**

Gone are the days when scientific experiments were planned in an unsystematic manner and the results analyzed irrationally. Being economical in terms of time, effort and money, and aiming at locating the 'best' under the competing objectives, the science of design of experiments (DOE) has become a regular feature in the conduct of research investigations. For decades, DOE has been applied in the development and optimization of pharmaceutical products or processes. Extensive work has been undertaken in the last about thirty years by various pharmaceutical scientists using response surface methodology (RSM) involving diverse kinds of 'statistical designs'. A recent survey of pharmaceutical literature carried out by us revealed that over four hundred research publications have already been published in leading journals on the subject. Almost every class of drug device have been successfully formulated using response surface optimization, which range from conventional formulations like tablets, capsules, liquids, semisolids, etc. to relatively intricate devices as microparticulate systems (microspheres, nanoparticles and liposomes), oral controlled release matrices, osmotic pumps, transdermal patches, etc.

Albeit the concept has become immensely important in drug industry, yet only a couple of standard treatises on pharmaceutical technology

deal with the subject that too quite scantily. As only limited reviews have been published dedicated to the specialized subject, the information mostly lies scattered in various texts and journals. Accordingly, the attempt to bring forth the pertinent facts and figures in the form of an integrated volume is indeed a commendable one.

Written in a lucid style, the book covers a myriad aspects of DOE and optimization, particularly on screening designs for qualitative factors, influence of factors, inferential aspects from 2D and 3D response surfaces, Taguchi method for quality assurance, etc. Most of the statistical designs popular in pharmaceutical practice have been discussed quite elaborately listing their relative merits and demerits with distinct emphasis to factorial designs. Also, the predictive models and their usage in optimization and validation through RSM has been aptly taken up. The remarkable highlight of the book is that it covers all the important steps in the formulation development viz. preformulation, formulation, process study and optimization, scale up and robust process. Based on the famous adage, 'A picture is worth one thousand words', a diversity of graphic outcomes of DOE optimization has been immaculately presented circumnavigating the matematico-statistical complexities. This makes the book a far more interesting reading and the topic far less fatuous. Each chapter is duly referenced to current literature and even important texts have been mentioned for further reading.

However, to guide novitiates, it would have been better to include a chapter on the basic terminology used in optimization practice. Also, a brief chapter on computer use in experimental

design was imperative, as formulation optimization is invariably implemented with the help of computer software written for the purpose. Another minor peccadillo of the book is that it covers experimental designs only up to two levels, when numerous pharmaceutical studies are carried out at three levels or more. We further suggest that the newer edition should embody the work examples pertaining not only to the oral matrices but to the variegated drug dosage forms, ample information on which is available from literature.

Still as already mentioned, the book is likely to serve the acute need of the hour. It can be a pleasure to the formulation scientists, pharmacy

students and researchers to become familiar with the principles and methodology of DOE and optimization. Since the academic level of the book is intermediate, to derive maximum benefit from the book material, the reader should be acquainted with rudimentary principles of the subject. In nutshell, the book can be an excellent addition to library shelves in the industry and academia.

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