

## Book review

***Emulsions and Nanosuspensions for the Formulation of Poorly Soluble Drugs*, Edited by R.H. Muller, S. Benita, B. Bohm, Medpharm Scientific Publishers, Stuttgart, 1998. ISBN 3-88763-069-6**

The publication resulted from the 3rd Colloidal Drug Carriers Expert Meeting held at Berlin in 1997. The book is divided into three main parts namely an introductory chapter, a section on the use of emulsions and a similar section on nanosuspensions. The final part of the book details various short reports on specific studies on emulsions, nanosuspensions and liposomes. Chapter 1 outlines the problem faced in the formulation of poorly soluble drugs and details a number of ways in which these substances can be made more accessible to the *in vivo* environment. Detailed treatment is given to the dissolution of drugs using oil in water emulsions as the editors argue that these drug delivery systems which are already in clinical use and have great potential are largely ignored when new formulations are being considered. The manufacture and laboratory scale preparation and characterisation of oil in water emulsions for parenteral and non-parenteral use is covered in large sections of the book. High Pressure homogenisation as a means of manufacturing emulsions is treated at length and Optical Reflectance is introduced as a means of measuring particle size in the micron domain with the authors stating that this method has the advantage over traditional methods such as laser diffraction as it can be applied to concentrated samples and hence used on line in industrial processes. The book's chapters are not confined to areas of preparation and characterisation of this delivery

system and biological data is also presented on the biodistribution of long circulating and charged emulsions and the safety and metabolism of parenteral nutrition emulsions.

Although the volume's title seems to suggest that emulsions and nanosuspensions for the formulation of poorly soluble drugs will be dealt with there is also ample space given to the use of emulsions in cosmetics and foods. There are some quite impressive micrographs of multiple emulsions in this part of the volume. The details from the food industry are interesting as they highlight the use of hydrolysed phospholipids and, as most formulators will agree, food excipients can be transferred to the preparation of oral dosage forms, as toxicology concerns, with such compounds, will be minimal. The urgent need for new materials is also stressed by some of the book's chapters especially if emulsions of high stability and with an extreme control on drug kinetics are to be realised.

Nanosuspensions are highlighted as a means of delivering poorly soluble drugs and industrial methods of preparation are detailed with the most commonly used method being high pressure homogenisation which appears to achieve particles with a 400 nm lower mean size limit. The characterisation of nanosuspensions using nuclear magnetic resonance spectrometry, X-ray diffraction (XRD) and differential scanning calorimetry (DSC) along with the other more common sizing and imaging techniques is presented as is the protein absorption patterns of these nanoparticles. High pressure extrusion and once again the ubiquitous high pressure homogenisation are the recommended industrial methods for liposome

manufacture, the former being capable of producing 100 l batches of material. It is in the presentation of manufacturing details by some of the book's chapters that the volume excels. These details are notoriously hard to obtain and the treatment of this subject matter by this volume will make this title especially useful for formulators in industrial settings.

As mentioned earlier, the book does not confine it self to the issue of poorly soluble drugs and along with data on cosmetics and foods there are reports on the interaction of liposome with DNA. While as stated above, the book will be very

useful for formulation scientists in the pharmaceutical industry, the book will also ideally suit final year undergraduates and Ph.D. students in the pharmaceutical sciences.

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