

## Book review

***Protein Formulation and Delivery*, by Eugene McNally (Ed.), Marcel Dekker, New York, 2000. ISBN 0-8247-7883-9**

A major problem of producing formulations of proteins and peptides is their inherent chemical and physical instability, which is a theme that runs throughout this book. The initial chapters clearly and concisely describe the reaction mechanisms and dynamics of peptide instability and the methods available for stability testing. The measurement of stability and activity, and the determination of conditions and formulation variables which affect stability, such as temperature, pH, protein concentration and excipients are covered in later chapters. Whilst these chapters form a coherent whole, the remainder of the book is somewhat disappointing, largely as a result of what is omitted rather than included. For instance, the chapter on freeze-drying, the predominant method for producing non-liquid protein formulations, is a good introduction to freeze-drying per se, but is surprisingly lacking in detail on the particular problems encountered with proteins. An outline of alternative drying methods, in particular spray drying would also have been useful. Only two chapters detail the delivery

of proteins, covering pulmonary administration and the production of matrix-based, sustained release formulations. One is left pondering the emphasis on this single route, whilst alternatives also employed for protein and peptide delivery, such as parenteral, buccal, rectal, nasal, vaginal, transdermal and oral routes are barely mentioned, if at all. Similarly the omission of delivery systems such as liposomes, emulsions and hydrogels is regrettable and ultimately limits the book's usefulness.

Thus, this book largely meets its stated aim: to assist pharmaceutical scientists in the development of stable protein formulations, but fails to live up to its title. It will be a useful starting point for issues relating to protein stability and the formulation of stable protein solutions. However, there are many texts already available which deal far more comprehensively with all aspects of protein delivery.

Kevin M.G. Taylor  
*School of Pharmacy,  
University of London,  
29-39 Brunswick Square,  
London WC1N 1AX,  
UK*