

Editorial

Formulation of peptides and proteins

The formulator who has only been used to working with low-molecular weight drugs quickly realises that the new peptide and protein drugs present him with some unfamiliar problems. The object of this special issue of *EJPB* is to present recent knowledge of some of these problems to a wide pharmaceutical public. I am particularly pleased that some of the best-known names working in this area agreed to contribute to this special issue. By virtue of their experience they can present original work and overviews of the current state of knowledge in this fascinating field of current research.

The papers in this special issue fall into two categories: in the first part of the issue there are three review articles, followed by six original papers discussing various problems with the formulation of proteins and peptides. Felix Franks presents a lucid description of recent advances in understanding the freeze-drying of aqueous solutions. Freeze-drying is still widely used as a method of stabilising and preserving peptides and proteins intended for therapeutic use. The application of Fourier-transformation infrared spectroscopy to study interactions between peptides, proteins and adjuvants in a dried state was advanced by John Carpenter, who provides a review of the application and utility of this method. In the third review paper, Georg Zografi gives us a succinct summary of current theories of water uptake into, and interactions with proteins in the solid state. The remaining six original

articles describe practical examples of protein formulation from both the stabilisation and controlled release points of view. Steven Nail presents work on protein inactivation during freezing and freeze-drying. Hans-Peter Merkle's article describes release problems with a parenteral formulation. A technique for fluorescent labelling of peptides is discussed by Achim Goepferich. Mike Grove's article describes interactions between gelatine and fibronectins. The special issue is concluded with two articles concerning protein incorporation into polymers by Maria Alonso and Tom Kissel.

I hope that readers find this special issue of interest and relevance to current efforts in formulation of peptide and protein drugs. My thanks go to the editor of *EJPB*, Robert Gurny, for agreeing to publish this special issue at my request, and to my secretary, Petra Neubarth, who coped splendidly with the to-and-fro of manuscripts and correspondence with the authors. Of course, my special thanks go to all of the authors who replied so promptly to my request for manuscripts for this special issue.

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