

IJP 01837

Book Review

NMR Spectroscopy in Drug Research Alfred Benzon Symposium 26

Jerzy W. Jaroszewski, Kjeld Schaumberg and Helmer Kofod (Eds.)
Munksgaard, Copenhagen 1988. 605 pp.; ISBN 87-16-06955-2 Price Dk Kr. 425 (£35).

This book is a report of the proceedings of the Alfred Benzon Symposium 26. In the preface the editors state "The aim of this symposium was to present a broad illustration of the applications of NMR to drug-related problems". In this respect the organizers of the symposium have most definitely succeeded. The applications covered in this text included routine utilization of NMR for structure elucidation, conformation analysis in solution and in the presence of biological macromolecules, investigations of drug–enzyme interactions and a number of *in vitro* and *in vivo* studies. In the opening contribution modern ideas on drug development are expounded. The idea that an understanding of biological mechanisms may lead to a more rational approach to drug design is put forward and that NMR has an important role in such work is discussed. The remainder of the book amply describes this approach.

A number of sections in the text detail the application of modern NMR methods to the structure elucidation of complex drug molecules. The effects of solvents on the tautomerism of gossypol and the relevance to biological assays is described. Investigations of the reaction of gossypol with amino acids are used as a model of enzyme inhibition. The elucidation of the structures of members of the vancomycin group of antibiotics by NMR is described and proposals concerning the mode of action of these compounds are elaborated. The application of NMR to conformational analysis of drugs in solution is described. In a section concerned with the conformational analysis of thyroid hormones there is a discussion of the interrelationships between infor-

mation available in the solid state from X-ray crystallography, data available from NMR on the drug in solution and theoretical calculations. The work on thyroid hormones investigated not only the conformation in solution but also in the presence of transthyretin (one of the specific transport proteins of thyroxine).

A number of contributions are concerned with the application of NMR to the study of enzyme inhibition. One section emphasizes the combined use of techniques such as X-ray crystallography, conformational analysis, molecular graphics and NMR along with the synthetic work of the medicinal chemist in the development of enzyme inhibitors. A number of examples including design of ACE, PLA2 and collagenase inhibitors are described.

A number of the sections of this book deal with the use of NMR techniques in both *in vivo* and *in vitro* studies. One example describes the use of NMR for the determination of tobramycin in plasma samples. This method was used to investigate the tobramycin rebound effect of patients undergoing dialysis. Several examples of the use of NMR methodology in the study of the effects of drugs on perfused organs are presented. In the concluding section of the book the application of magnetic resonance imaging and magnetic resonance spectroscopy is described.

As a non-specialist in advanced NMR techniques I found this book interesting. I read a number of the sections with great interest; however, other sections were at a level beyond my knowledge of NMR. The general presentation of the book is excellent and great care has been taken

in the illustrations in this text. I conclude that this work would definitely be of interest to those people working in these areas of NMR applications. It would also be worthwhile for other researchers

in medicinal chemistry to read this book and thus appreciate the developments that have taken place in recent years in this area.

J.S. Millership.

School of Pharmacy
The Queen's University of Belfast,
Northern Ireland, U.K.