

PREFACE

This volume presents the proceedings of a symposium on "Transport by Proteins" held at the University of Konstanz, West Germany, on July 9-15, 1978. In addition to the invited lectures, records of the discussions are included.

The role of proteins in the transport of various molecules, ions and electrons is known to be of great biological, medical and pharmacological importance. The topic of this Symposium covers a wide range of different systems of fundamental physiological significance, such as the transport of oxygen, metabolites, metal ions, drugs, hormones, etc., all mediated by proteins either in aqueous medium or through membraneous structures. Transport systems involving proteins also include multienzyme complexes and arrays of the oxidation-reduction chains of respiration and photosynthesis.

Both reversible and irreversible thermodynamics provide fundamental concepts for the main theme of this Symposium. Therefore, introductory lectures demonstrating some relevant principles, have been included in the programme. With regard to newer methodology, chemical relaxation and nuclear magnetic resonance on whole cells demonstrate more advanced and sophisticated experimental approaches which can be applied to the study of transport systems. Another section has been devoted to short surveys of some selected transport proteins and protein systems of fundamental biological significance, bringing us to the present level of knowledge in these fields. Several important and developing membrane protein systems have been grouped together in a separate section. Some selected metal-transport and storage proteins have been reviewed in another section, which also includes recent advances in the study of their structure and function. Finally, typical examples have been presented for the role of proteins in physiologically and pharmacologically important transport processes, again with the emphasis on new results and concepts.

Symposia or scientific topics should both promote the exchange of relevant information and also stimulate future research by the acquisition of new ideas and concepts. However, conferences are usually either overpopulated or devoted to a highly specialized topic. The aim of the present Symposium has been different: a limited number of scientists from various disciplines in the natural sciences were invited to present and discuss various aspects of a more general topic relevant to their work. It was hoped that, despite the diversity of systems and their functions presented, some common properties and principles underlying these transport processes would be recognized and developed further through interdisciplinary interaction. Both experimental and theoretical knowledge acquired for one system may be useful and complementary to another.

In accordance with the purpose of this Symposium, special emphasis was placed on the discussions, for which no time limit was imposed. To facilitate the discussions, preprints of the invited lectures were sent to the participants some time before the Symposium. A complete report of the discussions is added at the end of each lecture. These written records of a discussion were composed directly by the participants, in most cases immediately after a session. The invited papers have been reproduced directly from the typescripts submitted by authors. The contents of both papers and discussion remarks are presented with the personal responsibility of the respective authors.

Based on previous experience, the number of participants and lectures was considered optimal for the purpose indicated. Inevitably, many relevant subjects could not be treated within the framework of the Symposium, nor could all workers in a given field participate. The present volume should aid in transmitting the message of this Symposium to a much wider audience.

Our thanks are due to all participants who have cooperated in this Symposium. The generous financial support provided by the Deutsche Forschungsgemeinschaft (DFG) and the Federation of the European Biochemical Societies (FEBS) is highly appreciated. Further support extended by the host University of Konstanz, by the Gesellschaft der Freunde und Förderer der Universität Konstanz and by the Byk Gulden Lomberg Chemische Fabrik GmbH, Konstanz, is gratefully acknowledged.

Thanks are due to the staff of the Verlag Walter de Gruyter in Berlin for their effective cooperation in the preparation of this volume. The highly skilled and devoted assistance of Mrs. H. Allen in all technical matters concerning the Symposium, is greatly appreciated. Our gratitude is also extended to Dr. Stephen Bayne for his help in editing the book.

Finally, the editors would like to repeat the hope expressed in the wake of the symposium on "Protein-Ligand Interactions" held in Konstanz in 1974, that "meetings of a similar kind on various biological and biophysical topics of interest will be held in the future and will be instrumental in the promotion of new ideas and approaches in the natural sciences".

Konstanz, September 15, 1978.

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