Subcellular Biochemistry

Volume 12
Immunological Aspects

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Subcellular Biochemistry

Volume 12 Immunological Aspects

Edited by

J. R. Harris

*North East Thames Regional Transfusion Centre
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Preface

This volume and future ones in the series, which is now under new editorship, depart from the pattern established by previous volumes in containing chapters loosely related to one another. It is thus appropriate that each volume should have a relevant subtitle. In the present volume the underlying theme is immunology and its application to the study of a number of different biochemical systems.

Almost inevitably, the study of the cell-surface antigens and glycoproteins of a number of different tissues tends to dominate the contents, but considerable emphasis is also placed on subcellular organelles and enzymes. Undoubtedly, it is the impact of readily available monoclonal antibodies that dominates work in the field. The epitope specificity provided by monoclonal antibodies gives the biochemist a powerful lever with which to probe the location, structure, and function of cellular protein and glycoprotein antigens. A number of the chapters included in this volume have a strong biomedical emphasis. This is indeed intentional, as it is now the policy of the series to cover the more applied aspects of the subject, while in no way neglecting more fundamental topics in subcellular biochemistry.

Thus, the current plans for the series expand rather than diminish those developed by the founding editor, the late Donald Roodyn. Dr. Roodyn started the quarterly journal *Sub-Cellular Biochemistry* in 1971 and molded it into book format, as *Subcellular Biochemistry*, in 1978. This series title is to be retained along with the varying subject-oriented subtitles. A theme close to Dr. Roodyn's heart was the unification of cell biology and classical biochemistry. Time has certainly shown that the two do indeed walk hand-in-glove and that strict academic disciplines are at times quite artificial. Furthermore, it is now clear that the whole of biology—together with medical, agricultural, and technological biochemistry in all their diverse aspects—must now fall within the range of the series. Previously, the discipline of physiology was considered to be the “experimental basis of medicine,” but this designation must surely now be at least shared with, if not actually handed over to, biochemistry. At the time of Claude Bernard, physiological and biological chemistry had not evolved fully into the

discipline of biochemistry as we know it today. Yet it is the continuing penetrative influence of chemistry and physics in the natural and applied biological sciences that has led to the current strength of the experimental approaches of modern biochemical science, hopefully leading ultimately to Donald Roodyn's "integrated view of the cell."

While demonstrating the application of immunology in subcellular biochemistry, the chapters in the present volume fall into two discrete groups: those that dwell primarily on the study of cell-surface antigens and those that deal with a range of other cellular, subcellular, and enzymic applications.

Chapter 1, by Michael R. Price, presents a discussion of breast cancer antigens defined by monoclonal antibodies and immediately sets the "applied" character of the book. This chapter contains a detailed presentation of the epitope analysis of breast-carcinoma-associated antigens and the diagnostic and prognostic applications of monoclonal antibodies. Chapter 2, by A. H. Merry, H. C. Gooi, and D. Voak, deals with the immunochemistry and serology of the major human blood group antigens. This is followed by a chapter on the molecular characterization of the Rh₀(D) blood group by Carl G. Gahmberg. The fourth chapter, on the expression of ABH, Lewis, and related blood group antigens on the glycoproteins of the human jejunal brush border, by F. R. Green and colleagues, integrates very well with the two previous chapters on blood groups. In Chapter 5, a more fundamental account of the biogenesis and intracellular transport of intestinal brush border membrane hydrolases, investigated using antibody probes and tissue culture, is provided by Hans-Peter Hauri.

Leading into the second group of chapters, Chapter 6 presents a discussion of the immunoaffinity purification of membrane fractions from mammalian cells, contributed by Peter J. Richardson and J. Paul Luzio. There follows a survey of the use of antibodies for the analysis of secretory and endocytic paths of eukaryotic cells, by Yves Chicheportiche and Alan Michael Tartakoff. In Chapter 8, S. K. Malhotra discusses the use of monoclonal antibodies for investigating astrocyte structure and function. This is followed by a detailed account of current molecular approaches to experimental thyroid autoimmunity, written by Brian R. Champion and his colleagues. Finally, Chapter 10, by Zoltán Rakonczay and Stephen Brimijoin, contains a thorough description of the biochemistry and pathophysiology of the molecular forms of the cholinesterases.

J. R. Harris

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