

entire subject. The rapid developments in these areas, and the consequent speedy antiquation of any summary of existing knowledge, makes it doubtful that the time is ripe for such an attempt. The Editor of 'Immunochemistry of Enzymes and Their Antibodies' has been wise to illustrate the various approaches by six chapters, dealing with seven enzyme systems, each having been extensively studied by the authors of the particular chapter: lysozyme, β -lactamases, malic enzyme and fructose diphosphate aldolase, bacterial

ATPases, fatty acid synthetases and cytochrome *c*. In addition, one, and by far the longest chapter (57 pages), is devoted to a summary of methods and of results obtained with various types of quantitative methods of immunoelectrophoresis.

This volume will be a useful source of information for investigators who require an introduction to the immunological study of enzymes, or to the potential of immuno-enzymological studies.

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Platelets in Biology and Pathology

Edited by J. L. Gordon

North-Holland; Amsterdam, Oxford. American Elsevier; New York, 1977

xiv + 388 pages. \$ 53.95, Dfl 132.00

Until the last few years research involving blood platelets was largely the province of pharmacologists and haematologists. A few biochemists had realised the potential of these cells which provide an excellent model system for studies on the basic mechanisms involved in secretion and aggregation (as well as their attraction for the purpose of implied clinical relevance in the construction of applications for research support!). However, the major portion of the biochemical population have remained blissfully unaware that cells other than the erythrocyte, and perhaps the leucocyte, circulated in the bloodstream and could provide interesting systems for investigation. More recently there has been a marked increase in interest and the results of studies using platelets, which previously had been published almost entirely in clinical and specialist haematological journals, have started to appear regularly in the major biochemical journals. Conversely those workers whose research interests had been exclusively focused on platelets are starting to become aware that many of the properties exhibited by these fascinating little cells are not unique but are shared in greater or lesser measure by other aggregating and secreting systems. These similarities have been disguised by the remarkable overlay of jargon which characterises research on the blood platelet and by

the relatively inward-looking attitude of many workers in this field.

Thus although numerous monographs and conference proceedings dealing with the blood platelet have appeared (most recently an excellent CIBA Foundation symposium on 'The Biochemistry and Pharmacology of Blood Platelets') there are for the most part specialised volumes concerned only with platelet research in isolation or viewing the platelet in its clinical context of thrombosis and hemostasis; and they make no concessions to the biologist or biochemist who is unfamiliar with these areas. In this monograph Dr Gordon has therefore set out to introduce the blood platelet to a wider audience and to demonstrate the way in which studies using blood platelets can contribute to our understanding of a wide range of biological processes. Thus in the initial chapter Drs Gordon and Milner set out in admirably clear fashion the basic facts regarding the origin, structure and reactions of the blood platelet, and the proposed and established roles of this cell in various physiological and pathological responses. There can be fewer better introductions to basic platelet biology. The subsequent articles deal in detail with a wide range of aspects of the blood platelet and its functions, including adhesion and aggregation (Baumgartner

and Muggli), secretion (MacIntyre), receptors (Mills and MacFarlane), contractile and cytoskeletal elements (Crawford) and prostaglandin synthesis (Smith and Silver). Many of these do an admirable job of placing the platelet in its context and making clear the relationships to other systems. For example, MacIntyre's article on platelet secretion includes sections in stimulus-secretion coupling in leukocytes, mast cells and adrenal chromaffin cells which make clear the analogies and differences between these systems and underline the seemingly universal role of Ca^{2+} in the process. Crawford's treatment of the microtubular and microfilamentous system both compares the composition of the constituent proteins with those of other tissues and also examines the proposed relationship between the contractile apparatus of the platelet and that of muscle indicating both the similarities and differences.

Another area of general interest concerns the biosynthesis, and role in the response to stimulation, of the prostaglandins. These compounds are coming to be seen as a central part of the stimulus-secretion coupling mechanism in the blood platelet and are covered in an excellent article by Smith and Silver which provides a concise but comprehensive introduction to these important metabolites. Again sufficient background is included so that, at least in respect to biosynthesis, the unique pattern characteristic of the platelet can be appreciated. Unfortunately the area of prostaglandin research moves so rapidly that even though articles are referenced up to 1976 recent most important developments, e.g., the discovery of prostacyclin (PGI_2) and the recognition of the role of this unstable derivative in controlling platelet aggregation, are not discussed.

At a more specific level considerable attention is given to the properties, role and interactions of the various receptor systems on the platelet membrane. These are treated generally in the article by Mills and MacFarlane which provides a comprehensive account both of specificity of interaction and suggested mechanisms involved in various phases of the response with different agonists. Again this article is already somewhat dated especially in respect to the interplay of prostaglandins and ADP in the aggregation response. Subsequent articles take up the topics of storage of, and stimulation by, biogenic amines (Drummond) and

of the platelet-thrombin interaction (Majerus, Tollefsen and Shuman). The latter article clears up much of the confusion which has arisen over the past few years regarding the possible involvement of proteolysis and of high and low affinity receptors in the thrombin response.

However as with any multi-author text there are disappointments. The most important topic of the interaction of platelets with connective tissue (Jaffe) is a useful review of collagen chemistry but has virtually nothing to say about an area which lies at the heart of the role of the platelet in hemostasis. The article on platelet lipids in relation to function (Deykin) is also disappointing although in this case the lack of current knowledge may be largely to blame, except in the area of prostaglandins where this article overlaps with the much better treatment by Smith and Silver. One does however wonder whether discussion of the possible mechanisms of control of phospholipase A_2 in platelets and other tissues might well have been featured in view of the likely importance of this reaction in the response to stimuli.

In addition there are some articles which seem quite out of place in a monograph of this type notably that on β -thromoglobulin (Moore and Pepper). Although one accepts that this protein may serve as an important *in vivo* marker of platelet secretion the level of detail with which it is described appears quite inconsistent with the general focus as outlined initially.

These points are however relatively minor details in a monograph which overall provides an admirable account of the platelet in its biological context. Although with the rapid progress of research in this and related areas many of the articles will become out-of-date all too rapidly, Dr Gordon is to be congratulated on producing such a useful volume which even when dated will serve as an admirable resource for those workers wishing to enter this field. The quality of the production of the book is outstanding in an age when this matter often seems to receive little attention. It is only unfortunate that the price is likely to preclude its purchase by all but the most vitally interested. I would hope that many libraries will find it possible to purchase a copy.

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