

BOOK REVIEWS

Advances in Enzymology and Related Areas of Molecular Biology

Volumes 48 and 49

Edited by A. Meister

J. Wiley and Sons; New York, 1979

vii + 452 pages. £19.50 (vol. 48); vi + 374 pages. £15.50 (vol. 49)

Advances in Enzymology is too well known a series to require introduction to the biochemical community at large. There will be few workers in this and related fields who have not had occasion at one time or another to consult this series for authoritative articles in the general area of enzymology. The two volumes reviewed have continued the previous level of excellence and as has been the custom in recent years provide a mix of articles devoted to consideration of specific enzymes or enzyme systems together with reviews of a more general nature.

Volume 48 has perhaps a higher percentage of straight enzymological articles and a bias towards carbohydrate metabolism with reviews on phosphofructokinase (Uyeda) and glucose-6-phosphate dehydrogenase (Levy). In addition an article on glycosidases by Flowers and Sharon, although providing brief consideration of properties and mode of action, has as its main focus the use of these enzymes in studies on glycoproteins and their role in cellular responses, e.g., interaction with hormones, cell-cell interaction. The former two articles are for the most part purely factual accounts with little attempt at synthesis or critical analysis. Hence they will be useful primarily as an up-to-date source of information on these two enzymes but do not really contribute new ideas on their mode of regulation. Such ideas are sorely needed especially in the case of glucose-6-phosphate dehydrogenase since it is still far from clear what factors are responsible for control of flow of carbon into the pentose phosphate pathway and how this is integrated with other pathways which draw on glucose-6-phosphate. In contrast the review by Flowers and Sharon is far more incisive and provides an excellent introduction to the ways in which glycosidases can be used to probe complex carbohydrate structure and some of the problems which can arise in such studies due primarily to the lack of purity of the enzyme preparations employed. However despite the carbohydrate bias noted above volume 48 has articles of interest in other fields.

Those concerned with metalloenzymes will be present interested in the review by T. C. Stadtman of the biochemistry of selenium which, having been considered solely as a toxic element, is now recognised as a required micronutrient for higher vertebrates and some bacteria; and is implicated as a component of several enzymes catalyzing redox reactions. In all cases selenium appears to be present as selenocysteine in a protein which also contains cysteine residues raising the question of the mechanism of incorporation of this amino acid. The volume is completed by reviews on polynucleotide kinase, serine proteases in blood coagulation and on the lipase-colipase system as a possible model for heterogeneous catalysis.

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Volume 49 is better balanced between the specific and the more general articles. In the former category are reviews on kynureninases, tryptophan synthetase, mitochondrial ATPase and synthesis of phosphoribosyl pyrophosphate. All of these provide a comprehensive account of the particular topics and will be of interest to those concerned with these fields. The article on mitochondrial ATPase by Penafsky makes clear the degree of confusion which still exists with respect to the structure of this enzyme and the relationship of the various subunits which can be detected in purified preparations to differing functional states of the ATPase. Perhaps one should not be surprised that the problems which have always plagued the oxidative phosphorylation field should extent into the enzymological characterisation of the individual components. In the review on synthesis of phosphoribosyl pyrophosphate (PRPP) Becker, Raivio and Seegmiller provide a lucid account not only of the properties and regulation of PRPP synthetase but also of the manner in which the observations on the isolated enzyme may explain regulation of PRPP production in the intact cell. The availability of enzymes with altered properties from human subjects suffering from gout makes this a particularly interest-

ing system in which to examine the physiological significance of the in vitro data obtained using purified enzyme. The more general articles show a good distribution of topics. Schimmel describes the very interesting studies aimed at elucidating the mechanism by which specific tRNA-aminoacyl-tRNA synthetase recognition is obtained, a problem of central importance in phenotypic expression of the genetic information while Halvorson discusses the relationship of amino acid structure to amino acid transport in an article which provides considerable insight into the development of ideas in this field.

Finally Mildvan contributes one of his characteristically provocative reviews; in this case devoted to consideration of the role of metal ions in enzymes exhibiting differing coordination schemes at the three phosphates of ATP. The ideas presented are certainly stimulating and one hopes they will be borne out by further evidence.

In summary these are two worthy additions to a distinguished series and one hopes that most libraries (and even possibly individuals) who possess all or part of the series will be able to afford their purchase.

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Cytochrome Oxidase

Edited by T. E. King, Y. Orij, B. Chance and K. Okunuki

Elsevier/North-Holland; Amsterdam, New York, 1979
xiv + 426 pages. \$62.00, Dfl 125.00

This book publishes in camera-ready format the proceedings of the Japanese-American seminar on Cytochrome Oxidase held in Osaka, in the late summer of 1978. The scope of material is a little wider than merely that of the cytochrome oxidase (EC 1.9.3.1, Ferrocycytochrome c:oxygen oxidoreductase); also included are papers on cytochrome *P*-450 from *Pseudomonas putida*, cytochrome *o* from *Vitreoscilla*, and L-tryptophan 2,3-dioxygenase. Nevertheless, these variations on a heme do not account for more than 8% of the book.

As is usual with this sort of presentation, the

individual chapters summarize recent and current interests of the participants, and are comprised of material that has been published elsewhere in journals. Despite what might therefore appear to be a reduplication of publication, it is exceedingly useful to have in one book a comprehensive account of the state of research into a given topic. This is especially so when the topic covers a wide span of interests and disciplines, and where relevant work is reported across a wide spectrum of specialist journals. Thus happily cohabiting between the covers of this book are papers on the primary structure of cytochrome oxidase sub-