

newer insights into the thermogenic activity of brown adipose tissue and the regulatory role of malonyl-CoA.

This is clearly a book from which both specialists and non-specialists will read a

few chapters with great pleasure.

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### Wider aspects of protein phosphorylation in regulation

**Molecular Aspects of Cellular Regulation, Vol. 3: Enzyme Regulation by Reversible Phosphorylation - Further Advances**

*edited by Philip Cohen, Elsevier, 1984. \$75.00/Dfl.195.00 (xix + 250 pages) ISBN 0 444 80525 7*

Since the discovery of an ATP-requiring enzyme, which catalysed the conversion of phosphorylase *b* to phosphorylase *a* by E. H. Fischer and E. G. Krebs in 1955, the significance of protein phosphorylation and dephosphorylation in regulation of the activities of key enzymes in metabolism has been established. However, there is now considerable evidence to suggest that these processes play a much wider role in regulation and the contents of the 12 chapters written by experts in the various fields in the third volume in the series, *Molecular Aspects of Cellular Regulation*, provide an indication of this diversity.

The regulation of key enzymes in important metabolic pathways is exemplified by discussion of the phosphorylation/dephosphorylation of the mitochondrial branched-chain 2-oxoacid dehydrogenase complex in control of branched-chain amino acid oxidation, the intracellular triacylglycerol lipase in control of lipolysis in adipose tissue, cholesterol ester hydrolase in control of cholesterol formation in the adrenal cortex, cytidyltransferase in the regulation of phospholipid formation in hepatocytes, and bacterial isocitrate dehydrogenase in control of the Krebs cycle. In addition, the means by which phosphorylation/dephosphorylation regulates the concentration of a specific allosteric effector of 6-phosphofructokinase, fructose 2,6-bisphosphate, is also discussed. In nervous tissue, the rate of formation of the important monoamine neurotransmitters (dopamine, noradrenaline and 5-hydroxytryptamine) are regulated by the activities of tyrosine 3-monooxygenase and tryptophan 5-monooxygenase; both these activities can be regulated by a phosphorylation/dephosphorylation mechanism.

The possibility that the phosphorylation/dephosphorylation of proteins may control the concentration of proteins in

a cell is illustrated in three chapters: phosphorylation of yeast NAD<sup>+</sup>-linked glutamate dehydrogenase may increase its rate of degradation via proteolysis; phosphorylation of eukaryotic RNA polymerase I, which increases its activity, may be involved in increasing the rate of synthesis of ribosomal RNA; and the activity of ornithine decarboxylase, which may regulate the rate of formation of polyamines, is inhibited by phosphorylation. The recent discovery of a possible relationship among membrane phospholipid turnover, change in intracellular Ca<sup>2+</sup> concentration and activation of protein kinase C is also examined. The final chapter contains a discussion of the phosphorylation of key proteins in the chloroplast and the possibility that these processes are involved in controlling the rate of photosynthesis.

In terms of phosphorylation/dephosphorylation mechanisms the chapters are comprehensive and contain much experimental detail. Hence they are designed primarily for the advanced student and the research worker. Unfortunately, the emphasis is such that the uncritical reader might assume that in many cases phosphorylation/dephosphorylation was the only mechanism for control of specific pathways or processes. For example, in the chapter on control of cholesterol ester hydrolysis no mention is made of the fact that changes in the uptake of low-density lipoprotein-cholesterol might also be important in control of the rate of cholesterol formation; and in the chapter on nervous tissue monooxygenase it is stated 'serotonin biosynthesis in the central nervous system may be regulated solely by calmodulin-dependent protein kinase II', although there is considerable evidence that the intracellular concentration of tryptophan might also regulate the activity of tryptophan 5-monooxygenase.

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### Background for assessing usefulness of techniques

**Biochemical Research Techniques: A Practical Introduction**

*edited by John M. Wrigglesworth, John Wiley & Sons, 1983. £15.75 (x + 239 pages) ISBN 0 471 10323 3*

*Biochemical Research Techniques* is a collection of seven chapters, each dealing with a different technique and each written by a knowledgeable user of the particular technique. The techniques are absorbance spectroscopy, fluorescence, sin labeling, high-performance liquid chromatography, electron microscopy, immunoassay using monoclonal antibodies, and cell culturing.

In the preface, Dr Wrigglesworth states the purpose of the book to be a means of expanding a research student's or even an established researcher's knowledge of the basic theory, the applications and some of the practical aspects of the selected techniques. He admits that the choice of topics, although reflecting his own interests, 'covers areas of common interest to many laboratories in the biological and medical sciences'. Furthermore, the reader is led to understand that this will not be a specialist's comprehensive review of the techniques but rather provide sufficient background for the reader to assess whether these techniques 'would be use-

ful in helping to solve a particular problem'.

Dr Wrigglesworth set the example of his goal in his chapter on electron microscopy. Here the reader is introduced to some basic theory with appropriate diagrams illustrating standard equipment operation, to methods of specimen preparation, to methods of sample inspection, and to some applications. Throughout the chapter, ample references are given to supply the reader with additional background or technical reading on specific points. This model is well presented and does provide the type of information necessary for both teaching and learning. What the chapter lacks in comprehensive coverage is made up for by the thoroughness of the presentation.

Unfortunately, the remainder of the book suffers from inconsistent presentation. Some chapters continue with the editor's model. However, at least three of the chapters are just cursory introductory statements with no substance to their presentation, leaving the novice with no more than is given in an introductory biochemistry, cell biology, or modern biology undergraduate textbook.

By way of an example, the chapter on the principles and applications of HPLC (high-performance liquid chromatography) is neatly subdivided into the