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Preface

The First International Symposium on the Metabolic Interconversion of Enzymes was held in Santa Margherita Ligure, Italy, in May, 1970, under the direction of Professor G. Bonsignore. Because of rapid developments in this field, a second Symposium was organized a year and a half later in Rottach-Egern, Germany (October, 1971) by Professors E. Helmreich, H. Holzer and O. Wieland. At that time, so much new information had accumulated that it was decided to repeat such conferences approximately every other year; the United States was chosen as the next site. This publication reports the Proceedings of the Third International Symposium on the Metabolic Interconversion of Enzymes held at the Battelle Seattle Research Center, Seattle, Washington, June 5 - 8, 1973.

The conferences were originally designed to examine the control of metabolic reactions by covalent modification of certain key enzymes. Covalent, as opposed to allosteric or metabolic, regulation had first been recognized some fifteen years before. Initially thought to represent an added sophistication in regulatory processes possibly reserved to higher organisms, covalent regulation has now been found in both prokaryotes and eukaryotes. Those early studies in covalent modification revealed for the first time the existence of special "converter" enzymes whose purpose in life is to switch other molecules from one state of activity to another. It has since been found that several converter enzymes can act in succession to modulate a single metabolic step: besides allowing for a huge enzymatic amplification, such a "cascade" provides for annex molecules in which the information needed to control intracellular processes can be stored. Through converter enzymes, metabolic pathways can be linked to one another so that a given signal can trigger several physiological processes. An example is the phosphorylation of non-enzymatic cellular components such as histones, ribosomes and proteins related to muscle contraction, by the protein kinases which control carbohydrate metabolism. No doubt other examples will be uncovered. Recently, these conferences have been expanded to include protein-protein interactions, a topic which can no longer be overlooked, and the irreversible modification of enzymes, such as the initiation of metabolic events by limited proteolysis.

The organizers are greatly indebted to the Battelle Memorial Institute, the Fogarty International Center for Advancement in the Health Sciences, and the International Union of Biochemistry whose generous support made this Symposium possible.
They would like to express their gratitude to Dr. Tommy W. Ambrose, Director of the Battelle Seattle Research Center, Dr. W. R. Wiley, Coordinator of the Life Sciences Program of the Battelle Institute, Mr. L. M. Bonnefond, Conference Coordinator and the entire staff of the Battelle Seattle Research Center for making their facilities available to the participants and for the gracefulness with which they attempted to fulfill everyone's needs. Our thanks also go to Mr. A. W. Roecker, Librarian of the Battelle Seattle Research Center, for his invaluable help in preparing and editing this volume, Ms. Vera Swile for retyping the bulk of the manuscripts for photocopy reproduction, and to Dr. Danielle Gratecos for proof-reading them.

Finally, the organizers would like to express their sincere appreciation to the distinguished scientists who travelled from the four corners of the earth to attend this Symposium; their fine contributions form the substance of this book.

Seattle, Washington
August, 1973

Edmond H. Fischer
Edwin G. Krebs
Hans Neurath
Earl. R. Stadtman
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