PATHOPHYSIOLOGY OF PLASMA PROTEIN METABOLISM

To my wife Laura and my daughter Anna Giuliana

PATHOPHYSIOLOGY OF PLASMA PROTEIN METABOLISM

Edited by

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Preface

This book represents a factual account of the proceedings of an international symposium on the pathophysiology of plasma protein metabolism, which was organised in October 1982 by the Plasmaprotein and Immunology Division of the C.N.R. Institute of Clinical Physiology at the University of Pisa (Italy). Several of the contributors are former members of the International Study Group on Plasma Protein Metabolism, the last meeting of which was held in Turin (Italy) in 1974, under the auspices of the scientific organisation of the same institute.

The symposium took the form of a series of lectures, with the main objective of providing a positive contribution to the state of the art of several topics related to the kinetic and pathophysiological factors regulating the synthesis, distribution and degradation of plasma proteins.

The first four chapters form a group, each one considering a special aspect of the kinetics of turnover and distribution of plasma proteins in general; particular attention is paid to the recent advances in the field of kinetic modelling, the choice of the best models and the optimisation of the experimental designs. The next seven chapters consider the regulation of synthesis, distribution and catabolism of various classes of plasma proteins including albumin, immunoglobulins, complement fractions and acute-phase proteins. The remaining chapters deal with metabolic studies of various plasma proteins (including tumour markers, coagulation proteins and lipoproteins) in different disease states, such as malignancies, coagulative disorders, malnutrition and the extensive group of atherosclerotic cardiovascular diseases.

As editor, I would like to express my appreciation to the leading investigators in the field of protein metabolism who contributed chapters to this book.

Finally, I wish to express my deep gratitude to the two men who have greatly contributed to my scientific evolution. Professor Luigi Donato provided a unique broad perspective and overview coupled with a rational approach to biomedical research in general, and particularly to the pathophysiological view of the biological events which we have been studying. Professor Romano Bianchi's humanity, patient, encouragement, and stimulating and constructive criticisms throughout the years that I have known him have deeply influenced by own life, both professional and private. Without him this book would never have been published.

Obituary

to

MONES BERMAN, 1920–1982

With Mones Berman's death on 12 August 1982 the world of modelling, mathematical biology and physics, including friends and students, lost an inspiring colleague and a spirit of unbounding energy and interest.

Born 20 August 1920 in Lithuania, he migrated to the United States in 1938. After serving in the Army Signal Corps, he received his bachelor's degree in electrical engineering from Cooper Union School of Engineering in 1950. He was with Sloan-Kettering Institute from 1946 to 1958, first as a researcher in isotope and radiation physics (1946–1948), then as an electronics engineer and fellow in charge of electronic instrumentation (1948–1953) and then as a biophysicist (1953–1958). Also, from 1953 to 1958 Dr Berman was an Assistant Professor of Biophysics at the Sloan-Kettering Division of Cornell Medical College. The summers of 1952 until 1958 were spent as the Chief Radiation Physicist of the Radiation and Isotope Laboratory, Woods Hole, Massachusetts.

In 1957 Mones received his doctorate in physics and a year later became a senior physicist of the Mathematical Research Branch, National Institute of Arthritis and Metabolic Diseases, where he continued to apply his broad background in physics to the basic understanding of biological problems. In 1972 he was appointed acting chief of the Laboratory of Theoretical Biology, National Cancer Institute, where he remained until 1981, when he became chief of the renamed Laboratory of Mathematical Biology.

His international reputation stems from the world-wide use of the SAAM (Simulation, Analysis And Modelling) computer program package and the application of his modelling methodology and mathematical techniques to the study of biological systems. He investigated the kinetics of pharmaceuticals, lipids, lipoproteins, amino acids, glucose, insulin, calcium, zinc, lithium and many other systems. These endeavours led Mones to be actively involved in more than a dozen consultancies and committees, including the Editorial Board of *The Journal of Lipid Research* and the *American Journal of Physiology*.

All who knew Mones Berman realise that a listing of his scientific, teaching and organisational activities leaves untouched the essence of his recognition as an unusual human being. His global view of life was a constant source of inspiration, encouraging those who interacted with him to become pupils of this view.

Acknowledgements

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This scientific initiative was also supported by a P.H.S. Grant (No. CA34821) awarded by the National Cancer Institute of the National Institutes of Health, Department of Health and Human Services (USA), and by two grants from the Italian National Research Council.