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Edited by

Jeremias H.R. Kägi
Yutaka Kojima

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PREFACE

Metallothioneins, ubiquitous low molecular weight proteins of extremely high metal and sulfur content, are of great interest to various branches of the life sciences ranging from bioinorganic chemistry to biochemistry, molecular biology, physiology, toxicology, environmental science and medicine. They are believed to play a pivotal role in regulating the flow of the essential trace elements zinc and copper through the cell and in modulating the harmful environmental influences of toxic metals and of various stress conditions. Since the first international meeting held on this subject in 1978 the knowledge of the structure and the function of these proteins has been deepened and extended to molecular dimensions. Thus, the spatial structure of the protein and the mode of metal binding have now been established by x-ray diffraction and advanced NMR and optical techniques. The discovery and identification of unique genetic switching mechanisms opened the way for an understanding of the characteristic inducibility of this protein by metals and hormones and led to the utilization of the metallothionein genes as regulatory devices in genetic engineering and in transgenic experiments.

The Second International Meeting on Metallothionein and Other Low Molecular Weight Metal-binding Proteins held in Zürich, Switzerland, from August 21 - 24, 1985, was arranged as an official Satellite Meeting - IUB Symposium # 148 - of the 13th International Congress of Biochemistry, Amsterdam, The Netherlands, and hosted by the Institute of Biochemistry of the University of Zürich. It was sponsored jointly by the International Union of Biochemistry (IUB), the International Union for Pure and Applied Biophysics (IUPAB), the World Health Organization (WHO), the Scientific Committee on the Toxicology of Metals under the Permanent Commission and International Association of Occupational Health, the Schweizerischer Nationalfonds, the Schweizerische Naturforschende Gesellschaft, the National Academy of Sciences (USA), the Biological Division of the American Chemical Society, the Society of Toxicology (USA), and the biochemical societies of various countries (American Society of Biological Chemists, Australian Biochemical Society, Gesellschaft für Biologische Chemie (Germany), the Japanese Biochemical Society, and the Schweizerische Gesellschaft für Biochemie.

The meeting was attended by about 200 scientists from 21 countries including representatives from the International Programme on Chemical Safety of WHO, the Metals Specialty Section of the Society of Toxicology (USA), and the Scientific Committee on the Toxicology of Metals under the Permanent Commission and International Association of Occupational Health. The Introductory Lecture was given by the Honorary President, Professor Bert L. Vallee, on the topic "Implications of Metallothionein Chemistry". The scientific contributions were organized in six symposia, six colloquia and poster presentations and discussions.

This book comprises the proceedings of the meeting. Part I contains the introductory lecture, recommendations on the nomenclature on metallothionein and solicited review articles on the biochemical, molecular-biological, physiological, and toxicological aspects of metallothionein intended to facilitate access to this interdisciplinary field. Part II consists of contributions in symposia, colloquia and poster discussions. Part III contains the program of the meeting and the poster abstracts.

On behalf of the organizer and the participants, we acknowledge the generous financial support received from the Schweizerischer Nationalfonds, the Schweizerische Naturforschende Gesellschaft, the Union Schweizerischer Gesellschaften für Experimentelle Biologie, the Erziehungsdirektion des Kantons Zürich, the Krebsliga des Kantons

Zürich, the National Institute of Environmental Health Sciences (USA), the United States Department of Energy, the International Union of Biochemistry (IUB), the International Union for Pure and Applied Biophysics (IUPAB), and the Society of Toxicology Metals Specialty Section (USA). Our sincere thankfulness also goes to the University of Zürich for providing the facilities for the meeting.

We also acknowledge the assistance of the editorial staff of Birkhäuser Verlag, Basel/ Boston/Stuttgart. Special thanks also to Ms. Genia de Vallier for her devoted effort in the preparation and organization of the meeting and in the production of this volume.

April, 1987

Jeremias H.R. Kägi

Yutaka Kojima

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