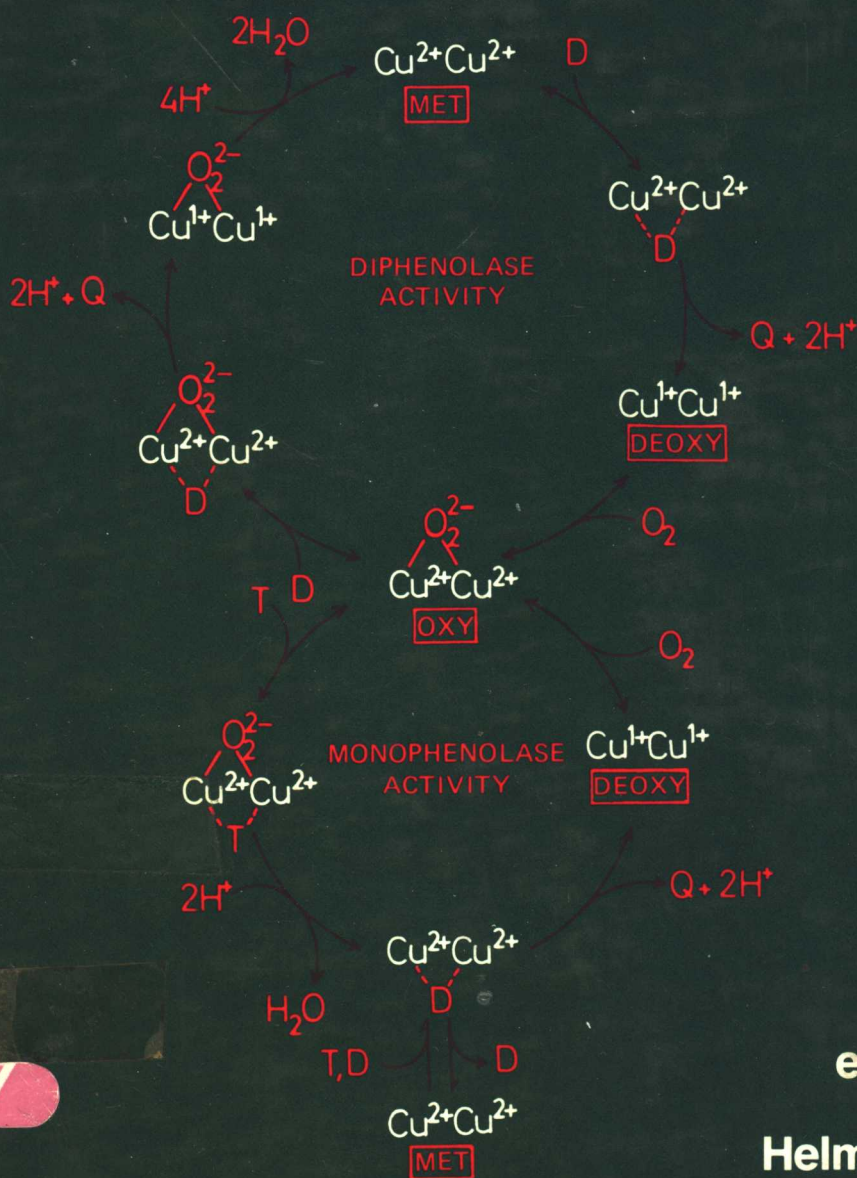


metal ions in biological systems

volume 13

copper proteins



edited by

Helmut Sigel

METAL IONS IN BIOLOGICAL SYSTEMS

Edited by

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PREFACE TO THE SERIES

Recently, the importance of metal ions to the vital functions of living organisms, hence their health and well-being, has become increasingly apparent. As a result, the long-neglected field of "bioinorganic chemistry" is now developing at a rapid pace. The research centers on the synthesis, stability, formation, structure, and reactivity of biological metal ion-containing compounds of low and high molecular weight. The metabolism and transport of metal ions and their complexes is being studied, and new models for complicated natural structures and processes are being devised and tested. The focal point of our attention is the connection between the chemistry of metal ions and their role for life.

No doubt, we are only at the brink of this process. Thus, it is with the intention of linking coordination chemistry and biochemistry in their widest sense that the series METAL IONS IN BIOLOGICAL SYSTEMS reflects the growing field of "bioinorganic chemistry." We hope, also, that this series will help to break down the barriers between the historically separate spheres of chemistry, biochemistry, biology, medicine, and physics, with the expectation that a good deal of the future outstanding discoveries will be made in the interdisciplinary areas of science.

Should this series prove a stimulus for new activities in this fascinating "field" it would well serve its purpose and would be a satisfactory result for the efforts spent by the authors.

Helmut Sigel

PREFACE TO VOLUME 13

The copper content of the normal human adult is in the order of 50 to 120 mg. While these trace amounts of copper are essential for life, amounts in excess of the needs are toxic. The element is distributed throughout the body, but the liver, brain, heart and kidney, in decreasing order, contain the highest concentration. The important function of copper is its participation in indispensable catalytic reactions and this element is part of the active site of a number of enzymes. Consequently this volume is devoted to "Copper Proteins," while the preceding Volume 12 deals with the more general "Properties of Copper" which seem important for biological systems and describes mainly low-molecular-weight complexes.

This volume opens with contributions on the evolution of copper proteins, the properties of copper "blue" proteins and of binuclear copper centers. Ceruloplasmin, tyrosinase, dopamine β -hydroxylase, cytochrome c oxidase, hemocyanins, copper/zinc superoxide dismutase and copper metallothioneins are then discussed in detail. The volume contains in total 10 chapters and terminates with a contribution on metal replacement studies of blue copper proteins.

Helmut Sigel

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