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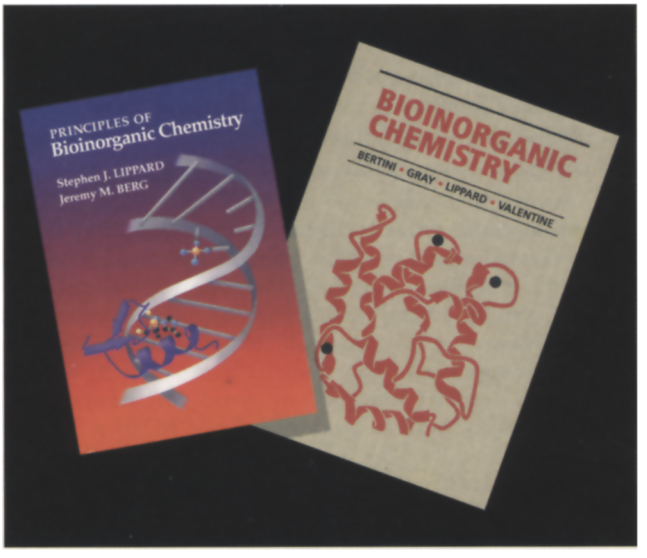
Bioinorganic chemistry: principles and practice

Chemistry & Biology March 1995, **2**:137–138

Principles of Bioinorganic Chemistry by Stephen J Lippard and Jeremy M Berg. *University Science Books 1994, 411 pages.* $36.00 paperback, $46.00 cloth (ISBN 0-935702-73-3 (paper)/0-935702-72-5 (cloth)).

Bioinorganic Chemistry edited by Ivano Bertini, Harry B Gray, Stephen J Lippard and Joan Selverstone Valentine. *University Science Books 1994, 611 pages.* $58.00 (ISBN 0-935702-57-1).



Two excellent new books have recently been published by University Science Books which fill the rather significant void in textbooks of bioinorganic chemistry for advanced undergraduates and beginning graduate students. *Principles of Bioinorganic Chemistry* by Lippard and Berg (paperback or hardback) and *Bioinorganic Chemistry* edited by Bertini, Gray, Lippard and Valentine (hardback), are surprisingly complementary. *Principles of Bioinorganic Chemistry* can stand alone as the sole text for a course in bioinorganic chemistry; it has all of the necessary background coverage of biochemistry, inorganic chemistry and physical methods, followed by a thorough coverage of essentially all major aspects of the field in eight additional chapters. In contrast, *Bioinorganic Chemistry* begins with the assumption that the reader has already mastered (or knows where to read about) the background principles mentioned above. Nine important bioinorganic topics are covered in chapters written by different sets of authors in greater depth and with much more thorough literature referencing than the shorter *Principles*.

The first quarter of *Principles of Bioinorganic Chemistry* concisely covers the background information that inorganic chemists need in the areas of biochemistry (including protein, nucleic acid and metal-binding coenzyme structure) and inorganic coordination chemistry (including thermodynamic and kinetic aspects as well as electronic structure and the concept of spontaneous self-assembly of model complexes) and also describes the most common physical methods that are used to study the structure of metal ions in biological systems. The authors have done an outstanding job of organizing this background information into short, practical chapters that establish the necessary foundation for the subjects covered in the following chapters. The rest of the book contains chapters on metal-binding units in biology, control of metal-ion concentration, metal-ion binding to biomolecules, electron-transfer metalloproteins, non-redox metalloproteins, atom/group transfer by metalloproteins, and the role of protein structure in controlling metal-ion properties and reactivities. A short chapter on new frontiers in bioinorganic chemistry completes the book. The book thus covers all of the major areas of current interest in the field of bioinorganic chemistry in a well-organized, coherent fashion. The frequent illustrations, most of which have been newly prepared for the book, are clear and helpful. Another useful feature is the presence of approximately half a dozen study problems at the end of each chapter. A bibliographic listing of thirty to forty key literature references, subdivided in the same way as the chapter, is also given at the end of each chapter. A very thorough index is provided at the end of the book. Altogether, *Principles of Bioinorganic Chemistry* is an superb stand-alone textbook for an advanced-undergraduate or beginning-graduate course in bioinorganic chemistry.

Much the same subject material is covered in appreciably greater depth and at a more advanced level in *Bioinorganic Chemistry*. Despite the greater depth of coverage (or perhaps because of it!), the text has a slightly narrower range of coverage of bioinorganic topics. The authors have chosen not to include background chapters on inorganic chemistry, biochemistry and spectroscopy, and have thus been able to devote twice as many pages to reviews of the major areas of the field. The book is divided into nine chapters, each written by well-known experts in the subject under discussion. The topics covered are: transition-metal storage and transport, zinc enzymes, calcium in biology, dioxygen carriers, dioxygen reactions, electron transfer, metal–sulfide proteins, metal–nucleic acid interactions and metals in medicine. Each topic is covered in considerable depth, with extensive referencing to the current literature (typically 200–300 references per chapter). In addition, an appendix is provided which offers suggestions for further

reading of a general nature and on relevant physical techniques, and gives additional suggestions for reading material that is relevant to each chapter. A very thorough index is also included at the end of the book. The topics of the individual chapters do not overlap very much. Consequently, the book does not suffer from the lack of continuity one might expect for a book written by distinct sets of authors. Most of the chapters contain enough background material to enable the reader to follow the more advanced concepts. All-in-all, *Bioinorganic Chemistry* is also an outstanding textbook for an advanced-undergraduate or, especially, a graduate special-topics bioinorganic course.

In summary, the two new bioinorganic-chemistry textbooks recently published by University Science Books offer complementary coverage of the field. *Principles of Bioinorganic Chemistry* will serve as an excellent stand-alone textbook with the necessary background material plus broad coverage of the field at a moderate depth of complexity. *Bioinorganic Chemistry* covers a slightly narrower set of topics in considerably greater depth and at a more advanced level, and has much more thorough literature referencing. The two books offer instructors of advanced-undergraduate and beginning-graduate courses that cover this exciting field an excellent choice.

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