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book reviews

Works intended for this column should be sent direct to the Book-Review Editor, whose address appears in this issue. All reviews are also available from **Crystallography Journals Online**, supplemented where possible with direct links to the publisher's information.

Handbook of metalloproteins. Vols. 1 & 2. Edited by Albrecht Messerschmidt, Robert Huber, Thomas Poulos and Karl Wieghardt. Chichester: John Wiley & Sons, 2001. Pp. xxviii + 1472. Price US$945.00. ISBN 0-471-62743-7.

This is an extraordinary compilation, in the German encylopedic tradition, its development stimulated by the recognition that metals play such an important role in biological systems that, on the part of the editors, 'the annotation of the rapidly growing knowledge and data on metalloproteins in a dedicated handbook has become overdue'.

In electing to review this work I lay no claim to any particular expertise in the field of metalloproteins. I do so only because the first two dozen or so names of possible reviewers that occurred to me as editor turned out to be those of contributors to the work who are, of course, ineligible. Indeed, the 201 names of scientists from 17 different countries given in the list of contributors to these volumes pretty well exhausts the possibilities for experts on the proteins covered!

The editors' aim is to bring together in one place all of the relevant information relating to individual metalloproteins in a consistent format. The three-dimensional structure of the protein appears on the first page of each article in the form of a ribbon diagram, followed by certain other mandatory information. The main heads under which this information is grouped are: functional class, occurrence, biological function, amino-acid sequence (though most are only referenced), production and purification and molecular characterization, metal content and cofactors, spectroscopy, X-ray structure determination and structural features, functional aspects, functional derivatives and references. Access codes for the Protein Data Bank are given. Special emphasis is placed on the geometry of the metal coordination site. That being so, only metalloproteins for which three-dimensional structures are available are included and these first two volumes contain entries for metalloproteins of redox-active transition metals (iron, nickel, manganese, cobalt, molybdenum, tungsten, copper and vanadium). Additional volumes are planned for metalloproteins of such non-redox-active metals as zinc, calcium, magnesium, sodium, potassium, mercury and silver.

Volume 1 deals with heme proteins: the storage and transport proteins – myoglobins and hemoglobins, cytochromes (15 articles), cytochrome peroxidases (5), oxygenases (3) and oxidoreductases (10). It also deals with the non-heme proteins containing iron–sulfur clusters (9) and non-heme mononuclear iron proteins (6). Volume 2 deals with other non-heme proteins: dinuclear iron proteins (6), iron-storage proteins (2) and iron transport proteins (4), and covers proteins containing nickel (5), manganese (4), cobalt (3), molybdenum/tungsten (10), copper – mononuclear type 1 (7), type 2 (4) and type 3 (2), binuclear (1), multinuclear enzymes (4) and storage and transport proteins (2) – and vanadium (1). Acknowledged as missing by the editors are reports on cytochrome c_3, aconitase, isopenicillin N-synthase and lipoxygenase. Contributions describing these proteins are planned in a 'future electronic version' of the handbook.

That future plan at once raises the question: why this hard-copy version? The answer presumably has to do with the economics of publishing and the present transitional period between the traditional printed word (and picture) and the bright new electronic future. A simple electronic copy of the printed version is easily produced but is less easily distributed on a commercial basis. However, the editors may have more ambitious plans. It is easy to imagine how an electronic version might be enhanced with links to all manner of current and archival locations, but not so easy to see what an immense amount of editorial work would be involved in doing so effectively. The improvement at present would be largely illusory. Most of the reference sources cited remain electronically inaccessible and most of those with electronic versions archive only a decade or so of issues. Few journals are as completely accessible as those of the IUCr. Out of curiosity, I decided to see how much of the information contained in one of the contributions could be directly retrieved by a search based solely on the name of the protein or by that name combined with one of the mandatory categories or with the names of cited authors. The answer for my first arbitrary choice was 100%, but that was only because the author had posted his contribution to his home page! More typically, the broad search produces two to three times as many links as references cited in the original. However, most of the links turned up are duplicates or dead ends and yield only some of the original citations together with references to earlier work by some of the authors. Only in a few cases did links turn up that actually led directly to information included in the handbook article and only in a very few cases did a link lead directly to more comprehensive or more up-to-date material.

In whatever format the information is or may later be presented, it is clear that the authors of the handbook have currently provided a valuable service in bringing together material from many sources in a way that greatly eases the task of both the expert and the newcomer in getting up to speed on a particular system, and the editors have combined these contributions so as to provide an overview of the role played by individual metals in the various classes of metalloproteins that would likewise be very difficult for an indvidual to assemble. Together, these efforts provide the justification for this excellent tool. Nevertheless, this is a commercial venture and, at just under $1000, only well funded libraries and research groups will be able to afford this purchase. In an ideal world, such a work would be available in simple electronic form and free of charge. In the real commercial world how does one price an electronic version and how does one deal with copyright issues? Publishers are still working on these questions and much of the future promise of electronic commercial publishing depends on getting the answers right. One need only consider the music industry to see the problems involved.

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