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Book Review

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Handbook of metalloproteins, volume 3

Wiley, 2004, pp 768.
price £375.
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It is estimated that metalloproteins constitute some 30% of proteins; this figure is likely to increase as the predictive power of bioinformatics and knowledge of the protein folds improves. A series that draws together the current knowledge in a concise and informative manner is highly pertinent in this rapidly expanding and exciting field. This volume completes the series, Volumes 1 and 2 having dealt with the redox-active metals: iron, nickel, manganese, cobalt, molybdenum, tungsten, copper and vanadium. Volume 3 continues with the redox-inactive metals: zinc and calcium. These two metals are amongst the most influential in biological systems, playing vital roles in the signalling and detection process (calcium/calmodulin) and the regulation of gene expression (zinc/zinc fingers), as well as a myriad of other indispensable functions.

The book is logically divided into sections of related proteins, e.g. zinc hydrolases, which are then further subdivided into those acting on peptide bonds and those acting on non-peptide bonds. The individual chapters are then constructed using the same format, beginning with the functional class and classification followed by occurrence, biological function, amino acid sequence, methods of production and purification, metal content and any cofactors, activity tests, methods of crystallization, overall structure, metal site geometry and mechanism of action. Where appropriate, there are supplementary sections dealing with protein-specific questions, such as 'calmodulin as a drug target'. The only exceptions to this format are the chapters dealing with the structural aspects of zinc sites, which necessarily pull together information on a large number of proteins.

In a volume designed for researchers interested in structure and mechanism there is still an abundance of information for the non-specialist reader. This includes consideration of the versatile bacterial aminopeptidases that are involved in site-specific DNA recombination, a function that is independent of the aminopeptidase activity, and the structural role of zinc in insulin storage. The diverse biological functions that related proteins are used for is emphasized by the astacin family, where crayfish astacin provides a digestive function, while most astacins of other organisms are involved in developmental processes, such as dorso-ventral patterning in *Drosophila*.

There are detailed descriptions of protein structure and the metal coordination sites, which are clear and provide—in concert with the sections on mechanism of action—the latest interpretation of the structural basis of enzyme specificity, such as the preferential action of nuclease P1 on single-stranded DNA and RNA. In each case the text is supported by numerous high-quality illustrations that further clarify the descriptions. The protein database accession codes are given for all the structures reported and a complete list of all codes cited is conveniently included at the end of the volume.

This excellent volume manages to combine the depth required to make it essential reading material for the biomolecular researcher, yet contains sufficient background detail to capture the interest of the casual reader—it is highly recommended.

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