Book Reviews

Peptides: Design, Synthesis and Biological Activity. Edited by Channa Basava and G. M. Anantharamaih. Birkhauser Boston-Springer Verlag, New York. 1994. xiii + 308 pp. 16.5 × 24 cm. ISBN 0-8176-3703-6. $89.50.

This book is published as a tribute to the many contributions of Professor K. M. Sivanandaiah of Central College, Bangalore, India, to peptide Chemistry. The first chapter is a very interesting account of how Professor Sivanandaiah developed a program in peptide chemistry in India and managed to do "good science" in spite of less than adequate facilities by Western standards at the time he began his career.

The rest of the book is divided into four sections dealing with peptide synthesis and methodology, peptide design, SAR of peptide hormones, and other biologically active peptides. The individual chapters written by various experts are entitled (1) K. M. Sivanandaiah: Twenty-Five Years of Peptide Research in Central College, Bangalore University, Bangalore, India, (2) Catalytic Transfer Hydrogenation and Hydrogenolysis by Formic Acid and Its Salts, (3) Syntheses of Natriuretic Peptides using a New S-Protecting Group, S-Trimethylacetamidomethyl (Tacm) Group, (4) Solid-Phase Synthesis of Cyclic Peptides, (5) Enzymatic Semisynthesis of Growth Hormone–Releasing Factor and Potent Analogs, (6) Recent Developments in the Synthesis of Glycopeptides, (7) Synthesis, Characterizations, and Medical Applications of Bioelastic Materials, (8) Synthetic Peptides in the Study of Viral Fusion, Inflammation, and Atherosclerosis, (9) "De Novo" Engineering of Peptide Immunogenic and Antigenic Determinants as Potential Vaccines, (10) Complementary Peptides: Applications of the Molecular Recognition Theory to Peptide and Protein Purification and Design, (11) Conformational Studies on Model Peptides and Peptidomimetics, (12) The Design and Synthesis of Long-Acting Oxytocin Antagonists Substituted in Positions 2, 7, and 8, (13) Calcitonin: A Minireview, (14) Importance of Ca^{+2}–Hormone Interaction in Conformation–Activity Correlations, (15) The Binding of Peptides and Proteins to Membranes Containing Anionic Lipid, (16) Synthetic Peptides Mimic the Active Sites of Fibronectin Receptors from Gram-Positive Bacteria, (17) Analyses of Various Folding Patterns of the HIV-1 Loop, and (18) Regulation of Human Immunodeficiency Virus Gene Expression by the Tat and Rev proteins.

The chapters are well-written and references are up-to-date. A table of contents and subject–index are included. The book is well-organized and quite readable. I recommend this book to all those involved in the design, synthesis, and study of peptide hormones.

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Bioinorganic Chemistry: Inorganic Elements in the Chemistry of Life. An Introduction and Guide. Wolfgang Kaim and Brigitte Schwederski. John Wiley & Sons, New York. 1994. xii + 401 pp. 19 × 24.5 cm. ISBN 0-471-94369-x. $39.95.

This book provides an overview of many of the facets of modern bioinorganic chemistry. It assumes a strong undergraduate training in chemistry and a working knowledge of biochemistry. Chapter organization combines two presentation styles that are commonly used in this area: *viz.*, coverage of relevant metallobiochemistry by classification of elements, and also by discussion around a small number of biochemical topics. There is a strong emphasis on subjects relating to catalysis. The text is written at a moderately advanced level and includes several sections on cutting edge topics where no clear consensus has been reached. As such, some of the information included may require substantive revision at a later stage. While focusing predominantly on *bona fide* biological molecules, frequent reference is made to related work on synthetic model systems.

Chapters 1 and 2 provide a background perspective of the field and review some essential aspects of metal–ligand solution chemistry. Chapter 3 develops the chemistry of ligand complexes as enzyme cofactors with a detailed overview of coenzyme B_{12}. Chapters 4 and 5 discuss two topics (photosynthesis and oxygen transport/storage chemistry) that will be familiar to most readers outside of the immediate field. This provides a vehicle for the introduction of physicochemical concepts and bonding theory. Chapters 6 and 7 concern iron-dependent redox enzymes and proteins, while chapter 8 further develops iron biochemistry with an overview of iron uptake, transport, and storage. Chapters 9–12 broadly develop aspects of the catalytic, structural, and redox biochemistry of nickel, copper, early transition metals (Mo, W, V, and Cr), and zinc. Chapters 13 and 14 discuss the bulk electrolytic properties and stoichiometric requirements for the alkali and alkaline earth metals. Consideration of insoluble salts of magnesium and calcium leads into a discussion of biomineralization in chapter 15. Chapter 16 provides a useful overview of the biochemistry of the main group elements (B, Si, As, P, Br, F, I, and Se). Chapter 17 concerns the biological chemistry of toxic heavy metal ions and others, including Pb, Cd, Tl, Hg, Al, Be, and Cr. The book ends with two chapters of biomedical relevance. Chapter 18 deals with inorganic radionuclides, with a focus on radiopharmaceuticals. Chapter 19 discusses the current status of the biochemistry of Pt, Au, and Li as chemotherapeutics.

The subject index is thorough, and a useful glossary is added as an appendix. Each chapter ends with a list of references to the original literature. The low cost of the text should make it an attractive buy for student-

sand advanced workers who require an overview of modern bioinorganic chemistry.

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The Organic Chemistry of Drug Synthesis. Vol. 5. Daniel Lednicer. John Wiley & Sons, Inc., New York. 1995. xii + 219 pp. 16 × 23.5 cm. ISBN 0-471-58959-4. $69.95.

The 5th volume of *The Organic Chemistry of Drug Synthesis* outlines the chemical synthesis of compounds compiled in United States Adopted Names (USAN) published by the United States Pharmacopeia, covering the period from 1988 (picking up from volume 4) to 1993.

The book is divided into 11 chapters and is organized by molecule type rather than by therapeutic area, starting with acyclic and alicyclic compounds and then moving into aromatic/polyaromatic compounds and steroids and concluding with heterocycles (5- and 6-membered), beta lactams, and fused heterocycles. Each compound included is accompanied by a brief discussion of its biological activity or therapeutic area, a short description of its synthesis, and a synthetic scheme. The synthetic details are not included, although at times interesting reactions and/or mechanisms are briefly discussed. Each drug presented has at least one reference given (journal, patent, or *Chemical Abstracts*) for those interested in further details.

Most of the syntheses described are short and simple, ideal for production of large quantities at low cost, although consequently lacking at times the luster of syntheses highlighting very complex structures and/or novel synthetic methodologies. Nonetheless, many drugs are produced by such straightforward means, and this book, which is written in a clear and concise manner, provides a good perspective and overview of the chemistry used in the production of pharmaceuticals.

The types of chemistry discussed are quite diverse, ranging from aliphatic and aromatic to the chemistry of steroids, beta lactams, and heteroaromatic/poly(heteroaromatics), and hence parts should be of particular interest to almost any practicing organic chemist. Although perhaps not essential for personal libraries, except for those particularly interested in the organic synthesis of drugs, this volume would be a good addition to any academic or industrial library.

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