

out of place here), and on the detailed biosynthesis of haem, of vitamin B12 and of selenocysteine. Other small molecules meriting individual chapters include  $\beta$ -lactams and penicillins (two chapters) and strictosidine, billed as ‘the biosynthetic key to monoterpenoid indole alkaloids’. Some other gaps are filled by a chapter covering various alkaloids grouped according to the amino acid from which they are derived.

Many peptide molecules are synthesized non-ribosomally, and synthases for gramicidin S are covered by Vater and Stein, while Narayan Rajendran and Mohamed Marahiel cover more generally the large, functional synthases that make peptides in a way somewhat analogous to the way in which polyketides are made by modular, complex polyketide synthases. Here too combinatorial biosynthesis strategies are proving an attractive direction.

It is inevitable that with a topic as broad as this a book of this character can attract criticism both for what it puts in (how coherent and comprehensive is it *really*, or is it a bit of rag-bag?) and what it leaves out. It does not entirely escape the former criticism, and how-

ever unfairly (given the vast literature) there are many many more secondary metabolites in the described classes that have not been picked. Indeed, the knowledge that underpins the existence of a major amino acid fermentation industry, centred largely in Japan, is virtually unremarked.

So overall, this is certainly a useful addition to the library, if not the individual bookshelf, but readers with just a general interest would find an Internet search engine as good a starting point. Thus my meta-search engine (Copernic2000) finds 49 hits for strictosidine while Web of Science picks up 133 entries for this word. It is the electronic media, as much as the vast amount of knowledge out there, that makes truly ‘comprehensive’ anthologies at once desirable yet an impossible dream.

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### **Comprehensive Natural Products Chemistry, Volume 5: Enzymes, Enzyme Mechanisms, Proteins and Aspects of NO Chemistry**

C. Dale Poulter (Volume Editor), Pergamon, an Elsevier Science Imprint, Oxford, 1999, 495 pp., ISBN 0-08-043157-7. Price EUR 387.50, US\$ 387.50.

This is volume 5 in the excellent series *Comprehensive Natural Products Chemistry*. Previous volumes have dealt with polyketides, isoprenoids, carbohydrates and amino acids. This one is devoted to ‘enzymes, enzyme mechanisms, proteins and aspects of NO chemistry’. Given the impressive high resolution 3D structures now available for a wide range of enzymes and other proteins, it was disappointing to see so few colour figures in the book (Chapters 10 and 14 were welcome exceptions). Other missing items included a discussion of how protein structure is determined, especially for proteins in solution.

The book includes chapters on ‘stabilization of reactive intermediates and transition states by H-bonding’, with a particular focus on enolate ion intermediates, ‘keto-enol tautomerism in enzymatic reactions’, and ‘nucleophilic epoxide openings’, focusing on the epoxide hydrolases and GSH transferases. Chapter 5 deals

with deamination reactions, especially adenosine and cytidine deaminases. Esterases (Chapter 6), including phospholipase A<sub>2</sub>, phosphatases (Chapter 7), and ribonucleoside diphosphate reductases (Chapter 8), are considered in depth. Chapter 9 gives an interesting account of radical reactions in lysine 2,3-aminomutase, PFL-activating enzyme and methane mono-oxygenases. Equally interesting is the discussion of cyclo-oxygenases I and II in Chapter 10. Cobalamin-dependent enzymes and glycosyltransferases are the subjects of the next two chapters.

Chapter 13, entitled ‘electrophilic alkylations, isomerizations, and rearrangements’, focusses on farnesyl pyrophosphate synthetase (the FPP abbreviation used by the authors is not included in the abbreviations list), protein farnesyltransferase and isoprene cyclases. Chorismate mutases are the subject of Chapter 14 and dehalogenating enzymes that of Chapter 16. Chapter 15 gave a fascinating account of thymine dimer photochemistry (although I am not sure how it fits into this book since it deals with the chemistry of the lesion rather than its enzymic removal). Chapter 16 explained the mechanism of antibody-mediated catalysis. Puzzlingly, there was no chapter on NO chemistry despite its inclusion in the title of the volume.

Overall, a solid book with some interesting chapters. The emphasis on chemical mechanisms is welcome to this reader, but will deter many life science students, as will the dull presentation of the book. There are better textbooks of enzymology available.

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**Comprehensive Natural Products Chemistry, Volume 6: Prebiotic Chemistry, Molecular Fossils, Nucleosides and RNA**

D. Soll, S. Nishimura and P.B. Moore (Volume Editors), Pergamon, an Elsevier Science Imprint, Oxford, 1999, 295 pp., ISBN 0-08-043158-5. Price EUR 387.50, US\$ 387.50.

This is volume 6 in the series *Comprehensive Natural Products Chemistry*. Previous volumes have dealt with polypeptides, isoprenoids, carbohydrates and amino acids. This volume covers RNA chemistry, RNA enzymes, rRNA, mRNA and ribozymes. Colour figures are interspersed throughout the volume enabling good 3D reconstructions of RNA structures.

The book includes chapters on RNA structure, chemical and enzymatic probing, chemical RNA synthesis (6 chapters). RNA editing, RNA enzymes, Ribozyme selection and enzymology constitute the next 4 chapters.

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Viroids (single-stranded circular RNA molecules, found only in plants) are described in a stand-alone chapter which is then followed by four chapters dealing with ribosomal RNA structure, turnover of mRNA, ribonucleotide analogues and ribozyme structure and function.

The title is an odd one given that in effect, the book is about anything you ever wanted to know about RNA. However, given the existence of an enormous RNA literature the volume cannot be regarded as definitive. Overall, it is a solid book with emphasis on chemical mechanisms very suitable for biological chemistry but not for life science researchers and students.

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**Comprehensive Natural Products Chemistry, Volume 7: DNA and Aspects of Molecular Biology**

E.T. Kool (Volume Editor), Pergamon, an Elsevier Science Imprint, Oxford, 1999, 733 pp., ISBN 0-08-043159-3. Price EUR 387.50, US\$ 387.50.

I am very fond of telling 'lay' audiences that although DNA is the genetic material we can handle it like a 'piece of chemistry' in the test tube. Of course, analysis of my remark would show that I do not strictly mean what I say. What I actually mean is that molecular biologists can carry out biochemical reactions on DNA in the test-tube, leading us to cut, re-join, clone and sequence DNA.

However, here is a book that does in fact deal with DNA from an almost entirely chemical standpoint. DNA is of course a natural product even when it is in the form of recombinant DNA molecules and thus is an entirely legitimate subject for a book in a series entitled *Comprehensive Natural Products Chemistry*.

The series has been produced as a result of the vision and persistence of one of the most brilliant and prolific organic/natural product chemists of the 20th century, Sir Derek Barton. Sadly, he died before the project was complete. Indeed, two of the 38 'prepages' are a reprint of a previously published obituary while another 18 form both a very interesting and informative preamble