

BOOK REVIEWS

The Chemistry of Antitumor Antibiotics, Vol. 1, W. A. REMERS, Department of Medicinal Chemistry, University of Arizona, Wiley-Interscience, John Wiley and Sons, 605 Third Avenue, New York, New York 10016. 1979. viii+289 pp. 16 x 23.5 cm. \$29.00.

This is the first volume in a new and timely series, and will be of interest to medicinal chemists, pharmacognosists, and organic chemists already working on such compounds, but especially to those contemplating working in the area. Other researchers—such as biochemists and pharmacologists—also interested in anticancer agents will find the book useful. The first volume covers those five families of compounds from which at least one member is approved for clinical use in the U. S. Each chapter covers discovery, isolation, structure elucidation, chemical transformations, mode of action, synthesis, biosynthesis, and structure activity relationships. There is an excellent balance between "pure" and "applied" chemistry in the author's approach.

Each chapter has a two to four page introduction summarizing many of the key points to be covered. This may be useful to those who are not sure they want to tackle the entire chapter. Chapter one covers the actinomycins (53 pp, 219 references); chapter two covers the anthracyclines (64 pp, 159 references); chapter three deals with the aureolic acid group (38 pp, 133 references); the fourth chapter is on the bleomycins and phleomyeins (41 pp, 101 references); and the fifth chapter deals with the mitocycins and porfiromycin (52 pp, 110 references). One drawback to the book is that most references are from 1976 or earlier; only one reference from 1978 is included (in an addendum to chapter four).

The author's style is a little repetitious at times, but neither this nor the few typographical errors (e.g. p. 79 the formula for rhodosamine should be $C_8H_{17}NO_3$, on p. 100 structures 90 and 91 are missing the 4-OMe, on p. 245 structure 86 should have a cyclopropane ring) detracts significantly from the general clarity of the presentation. Unfortunately, some infrared absorptions are given in microns rather than reciprocal centimeters, and ^{13}C NMR data is generally scanty. It is not clear that the exhaustive detailing of extraction conditions is necessary.

The discussion on p. 166 of the incorporation of radioactive tracers into members of the aureolic acid group requires comment. There is an important distinction between studies aimed at determining the metabolic pathway leading to a given metabolite and studies in which a random variety of labeled compounds are fed apparently in order to obtain labeled metabolite for biological studies. The former involves rigorous purification and chemical degradation to determine the specificity and location of the labels (e.g. reference 105, the pagination of which should be corrected to p. 394), while in the latter case (e.g. references 23, 106-108) the metabolites are rarely purified or degraded (reference 106 reports percent activity in ethyl acetate extracts!).

I recommend this as a valuable and timely reference source.

STEVEN J. GOULD,
School of Pharmacy, University of Connecticut

Applications of High Performance Liquid Chromatography. A. PRYDE, Maag A. G., Dielsdorf, and M. T. GILBERT, Department of Chemistry, University of Edinburgh. Halsted Press, John Wiley and Sons, 605 Third Avenue, New York, N.Y. 10016. 1979. xiii+255 pp. 16 x 24 cm. \$25.00.

The technique of high performance liquid chromatography (HPLC) has become increasingly important in natural products research during the last several years, to the point where it can now be stated that no natural products research laboratory should be without access to equipment for HPLC. In spite of the technique's importance, however, there have been few books published dealing predominantly with its applications (as opposed to those concerned primarily with its theoretical or instrumental aspects), and thus the appearance of this volume is likely to be well received by practicing chromatographers.

The book opens with a relatively brief section devoted to the theory and practice of HPLC, with short chapters as chromatographic parameters, equipment, the practice of HPLC, and modes of chromatography. These chapters are necessarily very condensed, but they contain full references to the original literature for those readers wishing to pursue a particular subject in more detail. In keeping with the practical orientation of the book, there is a helpful section on operating tips in the chapter on the practice of HPLC.

The major portion of the book is given over to a discussion of applications of HPLC, with sections on applications in pharmaceutical analysis (62 pp), in biochemical analysis (58 pp), in environmental analysis (18 pp), and in miscellaneous area (9 pp). These sections are well documented with literature coverage to the Spring of 1977, and are illustrated with chromatograms and structural formulae. Natural products occupy a prominent place in this portion of the book, and approximately 350 out of the total of 876 references in the book refer to the separa-

tion of natural products. This compares favorably with the 409 references to the separation of natural products contained in a recent review article (*J. Nat. Prod.*) and suggests that a combination of the review article and this book would provide an excellent source for information on the HPLC of natural products. While the review is more up-to-date than the book, and has a convenient tabulation of data for various natural products, the book has the advantage of a more detailed discussion of the HPLC of certain classes of natural products, as well as containing information on subjects which were outside the scope of the review.

The book concludes with a series of useful appendices, references, and both compound and subject indices. All in all, this would seem to the reviewer to be the best book currently available on practical HPLC, and its reasonable price in an inflated economy makes it an attractive book for individual purchase by the practicing natural products researcher.

DAVID G. I. KINGSTON,
Department of Chemistry,
Virginia Polytechnic Institute and State University

Biosynthetic Products for Cancer Chemotherapy, Volume 3. GEORGE R. PETTIT and RICHARD H. ODE, Cancer Research Institute, Arizona State University. Plenum Press, 227 West 17th Street, New York, N.Y. 10011. 1979. viii+197 pp. 15.6 x 23.5 cm. \$29.50.

The third volume in this series consists of two major parts. In the first part, new antineoplastic and/or cytotoxic agents appearing in the literature over the period April 1976 through July 1977 are tabulated. The data are arranged according to the format used previously, and information on the structure, biological activity, and organism of origin of some 100 compounds are listed. The second part, which comprises the major portion of the book, consists largely of a comprehensive listing of natural products obtained from marine animals, irrespective of whether biological data were available for the compounds listed.

This volume is a welcome addition to the literature on natural products, and will prove particularly useful to researchers involved in marine natural products.

DAVID G. I. KINGSTON,
Department of Chemistry,
Virginia Polytechnic Institute and State University

Receptors and Recognition. Series B, Vol. 5. Taxis and Behavior: Elementary Sensory Systems in Biology. Edited by G. L. HAZELBAUER, University of Uppsala, Sweden. A Halsted Press Book, John Wiley and Sons, New York. 1979. x+341 pp. 16 x 24 cm. \$45.00.

In these times when knowledge in the chemical and biological sciences is increasing at such a tremendous rate the specialist in any one area, such as natural products chemistry, finds it increasingly difficult to keep abreast of exciting developments in other areas. It is therefore satisfying that a series of books on Receptors and Recognition should now be made available so that without too much effort one can become acquainted with the latest research on the molecular basis of function and behavior. A diverse collection of organisms is considered but it is the editor's contention that there is a unifying theme, namely, that mechanisms of reception of chemical signals by an organism and their translation into a response ought to be few in number.

The first chapter discusses the mechanisms involved in the behavior of *Escherichia coli* when these bacteria are subjected to changes in the chemical composition of their environment. This is a fascinating subject and is presented in a way understandable to one not working in the field. It is particularly interesting to note the role of S-adenosyl methionine in methylation reactions which underlie the mechanism of bacterial chemotaxis. Two sets of proteins serve as methyl accepting substrates and are involved in the process of sensory excitation and subsequent adaptation. The methylation reaction and the function of these proteins are extensively reviewed.

In chapter 2, behavioral responses induced in certain bacteria by changes in light intensity are described. In particular, the mechanisms of this behavior (the photoreceptor pigments, sensory transduction, signal transmission, response regulation) in *Halobacterium halobium* are discussed.

The behavior of *Paramecium*, a free-living freshwater protozoan, is reviewed in the next chapter. The reversal in swimming direction or "avoiding reaction" is described as well as the ionic basis for this behavior. Various stimuli to which this organism responds are also considered. In this, as in other investigations of taxis covered in this volume, the use of mutants has been important in answering questions relating to the mechanism of the behavioral response.

Chapter 4 concerns chemotaxis and differentiation during the aggregation of *Dictyostelium discoideum* amoebae, eukaryotic cells which feed on soil bacteria. The remarkable life cycle of this organism is described and the role of cyclic nucleotide, cyclic AMP, in cell aggregation is extensively reviewed.

The soil nematode *Caenorhabditis elegans* is the subject of the next chapter. This small sightless worm will respond to a variety of chemical stimuli indicating the presence of several classes of chemoreceptors. A detailed analysis of the behavioral response is presented.

Chapter 6 is devoted to sexual chemotaxis and chemotropism in plants. Several organisms are discussed, including fungi (*Allomyces*, *Achlya*, and *Mucor*), brown algae, mosses, liverworts and ferns, and flowering plants. In the case of fungi and brown algae the substances which mediate chemotaxis or chemotropism are well defined and are discussed in some detail.

Insect pheromones, substances involved in communication between insects, are reviewed in chapter 7. The properties of pheromones, the way in which chemical signals are propagated and received are all discussed. The following chapter considers broader aspects of insect chemoreception. The structural organization of the sensory organs and their operation in the detection of sugars, amino acids and other substances is reviewed.

The final chapter deals with chemotactic factors which attract leucocytes or "white cells" of the blood of vertebrate species. These factors induce locomotion of the leucocyte towards damaged cells and tissues with subsequent phagocytosis of such objects. Many chemotactic factors are known, some of which are proteins and others peptides. The mechanisms involved in chemotaxis, phagocytosis and other leucocyte functions are discussed.

Each chapter is well presented and contains many up-to-date references so this volume will be useful not only to readers with a general interest in the subject of sensory systems in biology but also to those who plan to carry out investigations in a specific area.

TREVOR C. McMORRIS,
Department of Chemistry,
University of California, San Diego
La Jolla, California 92093

Compounds from Marine Organisms (CRC Handbook of Marine Science, Vol. I), JOSEPH T. BAKER and VRENÍ MURPHY, Roche Institute of Marine Pharmacology, Sydney, Australia. CRS Press, Inc., 18901 Cranwood Parkway, Cleveland, Ohio 44128. 1976. v+226 pp. 19 x 27 cm. \$36.50.

The recent surge of interest in marine natural products necessitates a systematic compilation of organic compounds isolated from marine organisms, and this book has been produced in response to such a need. The usefulness of this dictionary type of book for natural product chemists, pharmacologists, and marine biologists is unquestionable, especially since the authors lead one of the most active and successful research groups studying pharmacologically active substances from marine organisms.

In the main text, compounds are systematically arranged according to their structural formula (number of carbon atoms and then heteroatoms). Inclusion of the structures for all compounds makes it easy to pick up interesting molecules by just browsing through. Sources of the compound, data on biological activity, and selected references (with full titles) are listed for each compound. The indices consist of a compound name index, an author index, and a general index, which includes organism names and biological activities.

The major text is preceded by a brief summary of marine natural products according to compound type. It is certainly useful for those who are not familiar with the area, but with the limited space (57 pages occupied mostly by structures) it cannot help being superficial. Since this book is intended to be a compendium of marine natural products one should refer to more comprehensive treatments such as the marine natural product chemistry series recently edited by P. J. Scheuer of the University of Hawaii for a more detailed account.

As is always the case in any rapidly advancing area, a large number of new compounds have been discovered since the publication of this book, and some of the structures have been revised (e.g. such important compounds as saxitoxin). This reviewer hopes that the authors will up-date the contents in Volume II as soon as possible.

YUZURU SHIMIZU, *Department of Pharmacognosy, College of Pharmacy,*
University of Rhode Island, Kingston, Rhode Island 02881