

BOOK REVIEWS

Biosynthetic Products for Cancer Chemotherapy, Volume 4. GEORGE R. PETTIT, GORDON M. CRAGG, and CHERRY L. HERALD. Elsevier Scientific Publishing Co., Inc., P.O. Box 1663, Grand Central Station, New York, NY 10163, 1984, xv+430 pp. 19.5×26.5 cm. \$113.50.

Great strides have been made in the development of chemotherapeutic agents for the treatment of the myriad forms of cancer. Despite the considerable progress achieved in this complex endeavor, much remains to be done. The purpose of this series is to summarize developments in the isolation and identification of new biosynthetic products for cancer chemotherapy. This volume provides a review of work published from July 1977 to mid-1979.

The volume is divided into three sections. Part one is a brief overview of the cancer problem, focusing principally on an outline of the development of cancer. Part two is composed of a series of experimental procedures for the isolation of a variety of natural products; these procedures are reproduced from the original literature. Part three is a tabular survey of novel natural products isolated from 1977-1979, with emphasis on antineoplastic or cytotoxic agents. This section includes metabolites from terrestrial plants, microorganisms, and marine fauna and flora.

The first section should be of interest to readers from a wide variety of backgrounds, as it places the intense efforts of the last several decades into the broad perspective of cancer development and treatment.

Section two will appeal to a more limited readership, mostly scientists pursuing the isolation of natural products. Despite some redundancy in the procedures offered, this material will be particularly valuable for graduate students and others entering this challenging field, but it will have considerably less influence on those already established in natural products research.

The strength and appeal of this volume are centered in the last section. The extensive list of novel compounds is accompanied by bioactivity data (in vivo and/or in vitro) and an indication of the availability of various spectral data. This listing will be of considerable utility to researchers working in natural products isolation, synthesis, structure-activity relationships, biochemistry, and medicine.

Unfortunately, the book's greatest shortcomings also lie in the last section. The poorly reproduced and frequently hand-lettered structural drawings are distracting, difficult to read, and, in many cases, inaccurate. Four pages of errata are provided, yet some errors remain undetected or uncorrected. The high cost of this volume is also regrettable because many who would find it most useful will be unable to afford it.

This volume clearly belongs in any library's reference collection and will be a most worthwhile addition to the personal collection of anyone conducting research in the field of cancer chemotherapy or natural products chemistry.

JOHN H. CARDELLINA II, *Montana State University*

Enzymes in Organic Synthesis. CIBA FOUNDATION SYMPOSIUM. Pitman Publishing Ltd., 128 Long Acre, London WC2E 9AN, UK, 1985, xi+395 pp. 16×23.5 cm. \$35.

The presentations and discussion sections of the Ciba Foundation Symposium 111, "Symposium on Organic Synthesis Using Enzymes," held in London, 15-17 May 1984, are documented in this volume. Leading experts provide a current report of research concerning the application of enzymes in organic synthesis and related topics. The plenary lectures included are briefly described as follows. (1) J.B. Jones describes extensive studies with horse-liver alcohol dehydrogenase as a useful asymmetric oxidoreductase catalyst for organic synthesis. (2) A.R. Battersby illustrates the application of enzymes for the preparation of chiral tritium-labeled compounds for application in the study of enzyme reaction mechanisms. (3) S.M. Roberts presents a study of microbial reduction of bicyclo[3.2.0]hept-2-en-6-one to prepare optically active intermediates for the synthesis of prostaglandins. (4) M.D. Scawen discusses important factors related to the large-scale purification of enzymes. (5) K. Mosbach summarizes the current status and application of immobilized enzymes and cofactors. Two specific examples are mentioned for α -chymotrypsin in peptide synthesis and β -galactosidase in carbohydrate synthesis. (6) G.M. Whitesides outlines current and potential applications of enzymes as catalysts in organic synthesis, including examples such as lipase for kinetic resolution of epoxyesters, aldolase for the preparation of carbohydrates and analogs, methods for ATP regeneration, and preparative scale multistep enzymatic synthesis of important intermediates such as phosphoribosyl pyrophosphate, ribulose diphosphate, and the disaccharide lactosamine. (7) H. Simon and co-workers describe an interesting study of the enzymatic reduction of numerous unsaturated carbon compounds with enoate reductase. Studies of new methods for NAD(P)H regeneration using an electro-microbial or electro-enzymatic system were mentioned. (8) C. Fuganti describes the application of fermenting

baker's yeast for the preparation of optically active cinnamyl diols which are useful intermediates for the total synthesis of natural products such as carbohydrates and α -tocopherol. (9) C. J. Sih and co-workers present a strategy and kinetic theory for extending the application of esterases with poor enantioselectivity. (10) K. Kieslich and co-workers present examples of various microbial transformations of terpenoid substrates which provide new structures that are less accessible by direct chemical methods. (11) M. Ohno illustrates examples of asymmetric hydrolysis of prochiral diester substrates with pig-liver esterase and various microorganisms to provide intermediates designed for the enantioselective synthesis of carbapenem antibiotics, C-, and N-nucleosides. An empirical active site model for pig-liver esterase is presented. (12) J. Markuseen and H. Volund describe a study of the kinetics of trypsin catalyzed coupling and transesterification reaction in media with low water content. (13) A. R. Fersht and G. P. Winter present research directed toward redesigning enzymes using recombinant DNA techniques. Specific site-directed mutagenesis of tyrosyl-tRNA synthetase from *Bacillus stearothermophilus* was systematically studied. (14) E. T. Kaiser and C. Radziejewski demonstrate the ability to design new enzyme active sites by chemical modification. Covalent attachment of a flavin analogue to the Cys-25 site of papain converted this enzyme into an effective oxidoreductase.

This book consists of a collection of well-written contributions that contain useful references to the original research publications of the authors and to other pertinent details. The organizers of the symposium did an excellent job of bringing together a balanced and varied collection of pertinent topics, which, together, convincingly demonstrate the application of enzymes or microbial processes in organic synthesis. Publication of the questions, comments, and discussion sessions gives the reader the sense of actually being at the symposium.

This volume is a useful reference book and can serve as an introduction for organic chemists, biochemists, and microbiologists interested in the current state of this growing field of research. It is highly recommended to all science libraries. Those individuals working at the interface of biotechnology and organic chemistry will likely enjoy having this collection of varied research results in their personal collection. The reader cannot help be influenced by the pervading optimistic tone of this book concerning the application of enzymes in organic synthesis.

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Biosynthetic Products for Cancer Chemotherapy, Volume 5. GEORGE R. PETTIT, GORDON M. CRAGG, and CHERRY L. HERALD. Elsevier Science Publishing Co., Inc., P.O. Box 1663, Grand Central Station, New York, NY 10163, 1985, xii+656 pp. 19.5 \times 26.5 cm. \$159.25.

This volume, devoted to new natural products, covers the literature on the subject through the end of 1982. Although the title emphasizes compounds useful for cancer chemotherapy, many of the natural products listed have no reported activity in cancer screening systems or are active as antifungal, antibacterial, or antimicrobial agents. The compounds reported in this book are divided into several different categories. The new natural products that demonstrate antineoplastic or cytotoxic activity are grouped according to both structure and source, e.g., Chapter 5, Higher Plant Lignans. The compounds are tabulated within each chapter by increasing carbon number; the organism from which the compound was isolated, melting point, bioactivity, molecular weight, the type of spectral data available, and literature reference are given for all compounds. In addition to the antineoplastic compounds, large sections are devoted to marine animal and marine plant natural products. The compounds in each section are classified according to structure, e.g., terpenoids, and the compounds are listed within each chapter as described previously. One new chapter has been added to this volume, which briefly describes the syntheses of selected antineoplastic natural products by showing the key intermediates in the synthetic pathway. The references to the illustrated synthesis are given, and references to other syntheses of the compound are also provided.

This volume contains a large amount of information presented in a very useful format. The material compiled is of great interest to researchers who isolate and characterize new natural products from a variety of sources, since it provides a handy reference source to compounds of identical or similar structure. I think the usefulness of the book would have been enhanced by the addition of a molecular formula index, but this is a minor inconvenience in using the material. Synthetic chemists should find the book useful as a compilation of possible target molecules, and medicinal chemists who are interested in structure-activity relationship studies should also find compounds worthy of further study. I seriously doubt that most people will find this volume to be a book for their personal bookshelf, inasmuch as it is expensive and most useful when used in conjunction with the previous volumes. However, it is a book that should be available through a library to interested investigators.

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Remington's Pharmaceutical Sciences, 17th Edition. Edited by ALFONSO R. GENNARO. Mack Publishing Co., Easton, PA 18042, viii + 1984 pp. 21 × 29 cm. \$85.

This is the latest edition of a book that truly needs no introduction to persons involved actively in undergraduate pharmaceutical education. It has evolved over a century into a comprehensive, single-volume treatise covering the fundamentals of pharmacy from its scientific foundations to applications in contemporary practice.

This centennial edition, divided into nine parts, consists of 109 chapters contributed by 97 authors. An indication of the diversity of coverage is gained by noting the designations for the various parts; they are, in sequence: Orientation, Pharmaceutics, Pharmaceutical Chemistry, Radioisotopes in Pharmacy and Medicine, Testing and Analysis, Pharmaceutical and Medicinal Agents, Biological Products, Pharmaceutical Preparations and Their Manufacture, and Pharmaceutical Practice.

Chapter 25 (31 pages) is entitled Natural Products. It can be described as a basic textbook discussion of carbohydrates, glycosides, lipids, proteins, alkaloids, volatile oils, plant extracts, and prostaglandins. Antibiotics, biological preparations, enzymes, hormones, pesticides, and vitamins are covered in other chapters. These chapters are good general introductions to the respective categories of natural products, but space constraints preclude definitive coverage of the topics or extensive accession to reference literature. Monographs of various natural products with current utility are integrated into appropriate sections of the book. The monographic feature is useful for some reference purposes, but the research investigator should recognize that the book is not a reference compilation and that it lacks coverage of agents without current utility.

General or introductory discussions of scientific topics are inherently open to differences of opinion or criticism about selection of examples, oversimplification of complex situations, and some special details. This book is no exception. Upon reading Chapter 25, this reviewer found difficulty justifying the omission of any mention of jojoba oil (a liquid wax), questioned the statement that "ergot from different plants vary in composition" (alkaloid composition is more a function of fungal predisposition than the plant host), and noted the incorrect spelling of the common name *Rauwolfia* for the genus *Rauvolfia*. However, such relatively minor considerations do not detract from the overall value of a comprehensive, single-volume source for persons who need diverse information on a broad knowledge base.

Educators and investigators in the natural product area will continue to find the new edition of *Remington* useful for perspective and peripheral purposes.

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