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Book Reviews

Functional foods: biochemical and processing aspects
G. Mazza (Ed.); Technomic Publishing Co., Lancaster, 1998, 480 pages, ISBN 1-56676-487-4 (£77.00)

Foods are composed of numerous biologically active constituents that may contribute to enhancing good health. Increasing consumer demand and interest in optimising health benefits via food intake has been the driving force behind the rapid expansion of the functional food market. Functional foods have therefore become increasingly important in the food industry, and can be classified as foods or isolated food ingredients that deliver specific non-nutritive physiological benefits that may enhance health. This volume provides an in-depth coverage of the nature and physiological effects of biologically active components of major plant food products (cereals, oilseeds, fruits and vegetables), and dairy and fish products, capable of promoting good health and preventing or alleviating diseases.

The volume is composed of thirteen chapters, and begins with several chapters on cereal products, namely functional oat products, physiologically functional wheat bran, and functional products from rice. Consumption of diets high in oatmeal, oat bran or oat flour has been associated with a reduced risk of coronary heart disease. The next two chapters are concerned with flaxseed products for disease prevention, and functional grape and citrus products. Flaxseed is a natural source of phytochemicals (e.g. flavonoids and phenolic acids). Flax has been specifically targeted for study as a cancer-preventive food. Numerous studies have shown that flavonoids present in grape and citrus products possess beneficial effects (e.g. anticarcinogenic, anti-inflammatory, and antioxidant effects).

Functional vegetable products, the processing and properties of mustard products and components, designer vegetable oils, and functional products of plants indigenous to Latin America, are discussed in subsequent chapters. Cruciferous vegetables, such as broccoli, cabbage, and cauliflower, provide sources of non-nutrient phytochemicals, which play a role in cancer prevention. Onions and garlic contain a range of biologically active compounds and have potential anticarcinogenic and cardiovascular-protective effects. Specific attention to fatty acids in health and disease has created interest in speciality oils, especially γ-linolenic acid (GLA), which may play an important role in the aetiology of a number of diseases.

Other chapters presented in this volume cover the physiological components and health effects of ginseng, echinacea and sea buckthorn, functional milk and dairy products, functional seafood lipids and proteins, and the regulatory aspects of functional foods. With over 1800 literature references, this volume is of great value as a reference tool for food scientists and technologists, biochemists, nutritionists and public health professionals, and is therefore highly recommended for all researchers interested in the nutritional and medical benefits of food components, especially individuals involved in the design of functional food based products.

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Biochemistry and Molecular Biology, 2nd ed., by William H. Elliott, Daphne C. Elliott
Oxford University Press Inc., New York, 2001: pp. xxvii + 586, £22.99, ISBN: 0-19-870045-8

The advances that have been made in biochemistry and molecular biology over the last few decades have been phenomenal, with an ever-increasing avalanche of new information. *Biochemistry and Molecular Biology, 2nd ed.* is an introductory textbook covering topics of special interest as well as traditional areas of biochemistry. It contains more biological background information than most other biochemistry texts, and also focuses slightly more on areas of medical interest. Special emphasis has also been placed on areas of molecular biology such as cell signalling, cancer molecular biology, protein targeting, regulating protein degradation, the immune system and eukaryotic gene control.

The book is divided into six parts and starts with an introduction on the chemistry of the cell. The second part covers the structure of proteins and membranes and this is followed by a part on metabolism. Subsequent parts cover information storage and utilisation, transport of oxygen and CO_2, and mechanical work by cells. The text has been extensively updated since the *1st edition* with several chapters having been significantly rewritten, and several additional

topics being introduced into new chapters. Each chapter in the book starts with a general overview of the topic and then goes into more depth, allowing the reader to acquire a better understanding of the material. There are also comprehensive sets of references at the end of each chapter, and lists of problems to be solved, with the answers included at the back of the book.

Biochemistry and Molecular Biology, 2nd ed. is a well structured and clearly written and presented compendium, equally of value as a textbook or as an essential reference tool for students and newcomers starting in the field of biochemistry and molecular biology. The text is suitable for most modern courses, and also contains numerous clearly presented full-coloured illustrations and diagrams.

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Stereochemistry
D.G. Roberts, The Royal Society of Chemistry, Cambridge, UK, 2001, vii + 170 pp, ISBN: 0-85404-602-X £9.95

Stereochemistry is defined as the study of the three-dimensional structure of molecules. An understanding of stereochemistry is necessary in terms of both the relevant conventions and definitions that are in use, and what is happening at a molecular level during a reaction. The relative three-dimensional orientation of the reacting particles at any given time in the reaction is an important aspect of the reaction mechanism. This volume is part of The Royal Society of Chemistry 'Tutorial Chemistry Texts' series, which consists of texts that concentrate upon the fundamental areas of chemistry, providing a concise account of the basic principles underlying a given subject.

'Stereochemistry' contains eight concise chapters, the first of which discusses simple molecules, hybridisation, conformation and configuration. The next two chapters cover chiral molecules with one or with two (or more) stereogenic centres, respectively. Definitions and discussions of a variety of terms, such as chirality, enantiomers, optical activity, racemisation, D/L and R/S conventions, homochirality, diastereoisomers, *meso* and *syn/anti* configurations, and epimerisation, are provided in these two chapters. The fourth chapter details the stereochemistry of carbon–carbon and carbon–nitrogen double bonds, and introduces geometric isomers and the Cahn–Ingold–Prelog (CIP) convention (more commonly known as the E/Z convention), and canonical forms. Alkenes, dienes, and amides are used as examples, and hydroxylation, addition, and hydration (Markovnikov and anti-Markovnikov addition) reactions are used to explore specific stereochemical aspects.

Chirality without stereogenic carbon is discussed in the fifth chapter, and covers allenes, biphenyls, hexahelicene, silicon, germanium and tin compounds, amines, ammonium salts, phosphorus and arsenic compounds, sulfoxides, sulfonium salts and selenoxides. The next chapter covers stereoisomerism in cyclic structures and discusses configurational assignment and strain (angle strain, torsion strain and steric strain). Substituted cyclohexanes, decalins, and steroids are used as examples. The penultimate chapter focuses upon substitution reactions of saturated carbon, and details the stereochemistry of S_N1, S_N2 and S_N2^1 reactions. The final chapter covers prochirality, enantiotopic and diastereotopic groups and faces, and introduces Re/Si conventions for sp^2 hybridised carbon atoms. The use of NMR spectroscopy in stereochemistry, vicinal coupling constants and the nuclear Overhauser effect, are also covered in this chapter. Whilst the primary goal of this self-contained text is to make undergraduate students conversant with stereochemistry, it is also of use as a refresher course for all organic chemists, particularly those whose memories of stereochemistry are very distant!

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