

modified starches in the food industry is also included in this volume. This chapter discusses a wide variety of treated starches, including bleached and oxidised starches, and starch hydrolysates. The commercial production and utilisation of various starch derivatives, e.g. cross-linked starches, starch ethers and esters, is also presented. Information on permitted levels, digestion and metabolism, and toxicological data is provided where available.

The volume is extremely informative and well presented, with over 200 tables, drawings and equations, and is also extensively referenced, with more than 1750 literature citations. It is therefore highly recommended as an invaluable resource for food scientists, technologists and toxicologists, and is thus a welcome addition to any scientific library.

Charles J. Knill
John F. Kennedy

Bioorganic Chemistry: A Chemical Approach to Enzyme Action, 3rd Edition. Edited by H. Dugas, Springer-Verlag, New York, USA, 1996. xxii + 700 pp. Price £29.50. ISBN 0-387-94494-X.

Bioorganic chemistry is the application of the fundamental principles and the tools of organic chemistry to the understanding of biological processes. Such an understanding is often accomplished by the aid of molecular models which imitate the living processes in nature. The concept of the model construction is a study of the different parameters of a complex biological process. The success of many models indicates the progress that has been made in understanding the chemistry operation in biological systems.

All living processes require energy which is used for a variety of essential functions. The energy is obtained by performing chemical reactions inside cells. Many of the reactions involve combustion of food. When the food, such as carbohydrates, are eaten and digested, a large number of enzymes are released to cleave the sugars molecules to smaller fragments that will eventually be further oxidised by mitochondrial enzymes. Due to the exothermic nature of these processes, a good fraction of energy liberated will be stored as energy-rich phosphodiester bonds in the form of ATP molecules. At the end of the chain, molecular oxygen is finally reduced to water molecules. This is the essence of respiration, which is basically the result of a series of oxidations of carbon molecules which produces water. These transformations are also related to biochemical processes.

The third edition of *Bioorganic Chemistry* has been updated with examples and references. However, the

main change in this edition is a new chapter on molecular devices describing the aspect of supramolecular chemistry and illustrating some points for future development.

The book is divided into four major areas. The first section introduces bioorganic chemistry in order to understand the processes of enzyme action and biological transformations in the cells via models. Next, descriptions of the chemistry of amino acids, and the synthesis and properties of peptides are presented. Cellular metabolism is under enzymatic control and often the enzymes involved need a substance or cofactor, which is called coenzyme, in order to express their catalytic activities. Therefore, a subsequent section deals with enzyme chemistry, enzyme models and coenzyme chemistry. Finally, the molecular devices are offered.

Bioorganic chemistry provides a link between organic chemistry, biochemistry, and protein and medicinal chemistry or pharmacology. With outstanding figures and over one hundred reference articles, this book is a comprehensive and informative reference for everyone in the fields mentioned above and academia.

Pawadee Methacanon
John F. Kennedy

Medicinal Chemistry: Principles and Practice. Edited by F.D. King, The Royal Society of Chemistry, Cambridge, 1994. xxiv + 314 pp. Price £39.50. ISBN 0-85186-494-5.

The main aim of the medicinal chemist is to identify a potential drug candidate from an initial lead compound which possesses all of the desired qualities, e.g. sufficient biological activity, low toxicity, reasonable stability, water solubility (if required), good bioavailability, and suitable pharmacokinetics and dynamics, for successful development into a high quality, efficient, marketable product. In many instances drugs are associated with carbohydrates, glycoproteins and carbohydrate-directed enzymes in their activities.

This volume essentially encompasses the course of lectures presented at the 7th Royal Society of Chemistry Medicinal Chemistry School, at the University of Kent, and is intended to provide a reasonably sound and in-depth introduction to medicinal chemistry, for the benefit mainly of synthetic chemists who are new to the field. Chapters have been written by authors with a diverse range of scientific backgrounds thereby providing as broad a perspective as possible.

The principles and practices of modern medicinal chemistry are introduced and all aspects of drug discovery, from the initial lead to the final development, are covered. Topics discussed include drug-receptor interactions, enzyme inhibitors, pharmacokinetics, drug