

Structural Biological Materials

M. Elices (Ed.); Elsevier, Oxford, 2000, 376 pages, ISBN 0-08-043416-9 (\$146.00)

Throughout evolution, nature has produced materials that are perfectly adapted to fulfil specific functional roles, with properties of durability, strength, mechanisms of programmed self-assembly and biodegradability. Because processing and recycling are subjects of major concern, natural biological materials provide material scientists with inspiration and ingenuity, as biological compounds are biosynthesised under benign processing conditions and are biodegradable; excellent models for the production of advanced novel materials. The scopes of structural biological materials, which are characterised by hierarchical architectural design with lengths scales ranging from the molecular to macroscopic, are vast and impressive.

Structural Biological Materials is part of the Pergamon Materials Series, and adopts a multidisciplinary approach, focussing on recent advances in physics, chemistry and molecular biology. The book aims to show some examples of the relationships between the structures, properties and functions of biological materials: features that represent desirable objectives in the design and manufacture of synthetic structural materials. In the text, new areas are covered and updates on some topics are given. Themes not mentioned in earlier publications are also dealt with.

The book starts with an introduction followed by a section covering general concepts on the nature of natural materials and principles of structure–property relationships. Subsequent sections explore three sub groups of structural biological materials. The fundamental relationship between structure, property and aspects of design and engineering are explored in each sub group. The importance placed on the properties and specific functions of these materials are illustrated in relevant examples.

The section on hard tissue engineering, focussing on cortical bone, describes the main structural features of bone with details of its histology and mechanical properties, especially elastic constants and fracture and fatigue properties. The section on soft tissue engineering covers more ground, concentrating on characteristics and mechanical properties of cartilage and tendon, in addition to information on bioartificial implants and biomimicry. The engineering characteristics of fibre are covered in the final section, with information given on several fibrous biological systems, as well as silk fibres. A chapter on computer models for mechanical properties of fibres in general, and another chapter on the modelling of stress–strain behaviour of spider dragline is also included.

Structural Biological Materials contains numerous diagrams and illustrations and a glossary. It is an important reference book for graduates, academic researchers and scientists involved in the biological materials field.

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Handbook of Nutrition and Diet (Food Science and Technology Series, Vol. 104)

Babasaheb B. Desai; Marcel Dekker, New York, 2000, viii + 797 pages, ISBN 0-8247-0375-8 (\$195.00)

Nutrition and diet are concerned with the intake of food, digestive processes, the liberation of energy and the elimination of wastes, and all of the processes that are essential for maintenance, growth and reproduction. Nutrients are necessary for the normal functioning of organisms. A lack of adequate quantities of essential nutrients results in clinical manifestation of several physical and mental disorders in humans. Clinical malnutrition can result from a variety of factors, such as an imbalance of nutrients, inability to eat, malabsorption, loss of endogenous nutrients, or multisystem dysfunction producing clinical complications that may lead to morbidity and mortality.

The aim of this handbook is to present comprehensive principles of nutrition, food science and technology, and diet and human health in a lucid and simple manner and show how this information can be utilised to maintain a normal healthy body. The handbook is divided into four parts, the first of which emphasises various food nutrients (namely, carbohydrates, lipids, proteins, vitamins, minerals, and water), and their functions in the human body. Body composition, energy needs, and recommended daily allowances (RDAs) are also discussed. The second part of the handbook describes various food sources and their acceptability. Topics discussed in this section include health and dietetic foods, foods of plant and animal origin, potential protein, fat and oil sources, food processing and preservation methods, food additives and nutrification, food labelling, quality assurance and food safety, and food transportation, distribution and marketing.

The third part of this volume deals with food consumption and utilisation, describing adequacy of diet, food digestion, absorption, metabolism, and excretion of wastes, endocrine systems and regulation of food intake, evaluation

of food and nutritional status, and dietary allowances and goals. The final part of the handbook discusses the nutritional management of various human disorders and diseases, including heart and circulation disorders, cancer, diabetes, and diseases of the bones, teeth, skin, hair, kidneys and liver. The relationship of diet to nervous system disorders and mental health is covered, in addition to the nutritional management of underweight babies and treatment of alcoholism, the management of inherited metabolic disorders and gastro-intestinal diseases, as well as minor disorders such as sepsis, hemopoiesis, anaemias, asthma, and food allergy. The final chapter in this section presents an integrated approach to human dietetics and health.

This authoritative volume is a valuable reference source for food scientists, nutritionists, dieticians, and individuals involved in the food industry, agricultural industry, and medicine.

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Cell and Developmental Biology of Arabinogalactan-Proteins

Eugene A. Nothnagel, Antony Bacic, Adrienne E. Clarke (Eds.); Kluwer Academic/Plenum Publishers, New York, 2000, xix + 301 pages, ISBN 0-306-46469-1 (£96.00)

Arabinogalactan-proteins have a large impact in plant physiology. They are ubiquitous, and are involved in diverse physiological effects including apoptosis, cell division, arrest of growth (reversible), oxidative bursts/wounding, somatic embryogenesis, pollen tube growth, chilling protections, microsporogenesis, growth suppression and xylem formation. Different arabinogalactan-proteins may have different tissue and cellular locations, and some appear and disappear during development. They also have a range of functions, however, to date, no one function of a single arabinogalactan-protein is understood.

The field of arabinogalactan-proteins is heading towards a greater understanding of both the form and function of arabinogalactan-proteins and their reciprocal relationships. *Cell and Developmental Biology of Arabinogalactan-*

Proteins is based on the 20th Symposium in Plant Physiology at the University of California, Riverside. The volume aims to increase the understanding of how the design of these proteoglycans is adapted for their seemingly myriad functions.

This book is divided into seven sections, each of which contains a selection of papers, complete with detailed referencing. Initially, the structure and biosynthesis of arabinogalactan-proteins is covered, followed by the localization and action of these proteoglycans at the subcellular and cellular levels. In subsequent sections, the roles of these proteoglycans in somatic embryogenesis, reproductive development and vegetative development are examined. Finally, information on medically and industrially important arabinogalactan-proteins and related macromolecules is given. The last section contains a selection of relevant short papers and abstracts.

The potential commercial uses of arabinogalactan-proteins, such as their possible use to induce immunostimulation in animals, are discussed in this text, as are the industrial uses (in the food and cosmetic industries) of these proteoglycans, which rely on their functionality as emulsifiers. This up-to-date and well-structured book has enormous value as an essential reference tool, and is highly recommended for scientists and researchers interested in the biology of arabinogalactan-proteins.

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Cereal Biotechnology

Peter C. Moris, James H. Bryce (Eds.); Woodhead Publishing Ltd, Cambridge, 2000, 264 pages, ISBN 1-85573-498-2 (£95.00)

Cereals provide the foundation of the world's diet, with more than half our food being derived from wheat, maize and rice. Genetic modification is one of the most important and controversial issues facing the food industry, especially in cereal production and processing, where its potential benefits and drawbacks are being seriously debated. *Cereal*