

## Book Reviews

**Biotechnology & Genetic Engineering Reviews; Vol. 16**  
S.E. Harding (Ed.); Intercept Ltd, 1999, xviii + 418 pages,  
ISBN 1-898-29858-0, £95.00

*Biotechnology & Genetic Engineering Reviews* is a well-established hardcover review series with one new volume published each year. This new volume contains 17 original, major review articles covering important developments in industrial, agricultural and medical applications of biotechnology with particular emphasis on the genetic manipulation of the organisms concerned.

Now that the nutritional requirements of infants, adults and patients are becoming more clearly defined, biotechnology is moving to the forefront of lipid modification strategies. *Biotechnology & Genetic Engineering Reviews, Vol. 16* includes an overview of how biotechnology, in the form of lipase-catalysed reactions, biotransformations and genetic engineering of oilseeds, allows both nutritional and physical modification of fats and oils. This new volume also includes new or previously unreported data on xylans of industrial and biomedical importance along with biomedical and pharmaceutical applications of alginate, chitosan, biopolymer mucoadhesives, amorphous saccharides, polysialic acids, and the non-folding functions of the chaperonins. The rationale for undertaking genetic modifications of skin for clinical or investigative purposes and the assessment of the progress made are also reviewed.

Topics of interest such as transgenic tomato technology, genetic manipulation of starch biosynthesis, the functions of 4- $\alpha$ -glucanotransferases and their potential use in starch processing are featured. The volume also contains up-to-date descriptions on pullulan from agro-industrial wastes, microbial polysaccharide products, and plant-microbe interactions with focus on pectin structure and microbial pectin degrading systems. Recent advances in rapid sequencing technology for N- and O-linked and GPI anchor glycans are described with the underlying aim to view glycoproteins in their entirety and correlate the roles that sugars, proteins and anchors play in the structure and function of glycoproteins. Correlations are established between the chemical structure and conformational characteristics of polysaccharides and the properties of interfaces formed by them. Technical advances and applications on analytical ultracentrifuge technologies for the characterisation of biopolymer gels and microgels estimating the potential of this technology for the future is also featured.

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## Introduction to Plant Physiology

W.G. Hopkins; 2nd ed., Wiley, New York, 1999, 528 pages,  
ISBN 0-471-19281-3, £28.50

Plants germinate, grow, develop, mature, reproduce, and die. Plant physiology is the study of these processes. It is about how plants use the energy of the sun to assimilate carbon, and how they convert the carbon to the organic material of which they are made. It is about how plants obtain and distribute nutrients and water. It is about how they grow and develop, how they respond to the environment, how they react to stress, and how they reproduce. Plant physiology is about how plants function, how and why each plant behaves in its own peculiar.

*Introduction to Plant Physiology*, Second Edition blends modern molecular approaches with traditional physiological and biochemical methods and environmental physiology in order to understand how plants work. Topics such as water relations of plants and plant cells, the acquisition of inorganic nutrients, and the significance of roots and root-soil interactions are featured in Part 1. Part 2 covers energy transduction and carbon metabolism. The role of carotenoids has been expanded to take into account the contribution of the xanthophyll cycle to photoprotection. Plant development and its regulation is the focus of Part 3. The significance of the role of molecular genetic approaches to the study of hormone action, photoperiodism, and other aspects of development has been amplified. A new chapter "Molecules and Metabolism" discusses aspects of primary and secondary metabolites, terpenoids, glycosides, phenolics and alkaloids. Part 4 deals with "The physiology of plants under stress" which includes a new section on insects and disease stress. A relevant chapter on biotechnology,

which has been expanded and updated to show how rapidly this aspect of plant physiology is moving and its potential for the future complete the book.

This revised and updated textbook introduces the student encountering plant physiology for the first time to fundamental concepts of plant physiology. The Summary, Review questions, and Suggested readings at the end of each chapter help students develop a solid understanding of the material covered. The number of references is limited in order to avoid disrupting the narrative and interfering with the flow of ideas that is essential to developing an understanding of a subject.

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### Chitin and Chitinases

P. Jollès, R.A.A. Muzzarelli (Eds.); Birkhäuser, Basel, 1999, xi + 340 pages, ISBN 3-764-35815-7, DM 268.00

Chitin is the most abundant nitrogen bearing organic compound found in nature. It is an insoluble polymer consisting of 1,4 linked *N*-acetylglucosamine residues in the  $\beta$ -D-anomeric configuration, and is the most common constituent of insect exoskeletons, shells of crustaceans and fungal cell walls. *Chitin and Chitinases* is divided into three parts, with an initial short introductory presentation of these polysaccharides in the natural environment. The first part is devoted to chitin biosynthesis, both in vitro and in vivo, the structural organisation of chitin in vivo, and chitin synthases in yeasts and fungi. The role of chitin oligosaccharides in plant morphogenesis and the biochemical aspects of inhibitors of chitin synthase are covered, as are the chitin binding proteins.

Chitinases, which split the  $\beta$ -1,4 glycosidic bonds of chitin (similar to lysozymes), are discussed in the second part of the text. The biochemical, structural and evolutionary aspects concerning chitinases are covered in turn, along with chapters mentioning enzyme inhibitors and newly characterised mammalian chitinase-like proteins. Aspects concerning *N*-acetyl- $\beta$ -D-glucosaminidases, enzymes releasing *N*-acetylglucosamine monomers from chitin, are also discussed in relation with their growing medical importance.

Finally, the third part is devoted to chitosan; a family of

deacetylated chitins, which are used more and more frequently in the agriculture, food, cosmetic and pharmaceutical industries. It is an important chitin derivative, which occurs in the composition of threads, fibres, films, gels, microspheres and liposomes. Some exciting applications are mentioned, which emphasise that applications of chitosan, based on its biological significance, often depend on its biodegradability.

*Chitin and Chitinases* presents some of the most recent and sophisticated chitin-related advances in the life sciences. It is the work of over 50 contributors, with each chapter consisting of an article, which contains extensive referencing. Overall, this book provides a stimulating background for further productive research on chitin in the biochemical and biological fields.

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### Toxic Plants—Dangerous to Humans and Animals

J. Bruneton, Intercept, Lavoisier Publishing, 1999, 560 pages, ISBN 1-898-29862-9, £99.50

Respiratory allergy, allergic dermatitis, phytophotodermatitis, and thorn injury are plant problems as probable as ingestion. Every day physicians, pharmacists, and veterinarians deal with incidents and accidents caused by plants. They are mostly ill-prepared to manage such cases and sorely need reliable information on the subject. *Toxic Plants—Dangerous to Humans and Animals* fulfils this need. The scope of the book includes houseplants, the consequences of widespread enthusiasm for a return to nature, and the impact of plants on companion animals.

A brief Part 1 provides a useful statistical data on frequency and true consequences of accidents caused by plants. It lists the common causes of incidents and accidents induced by plants in humans, describes the risks, emphasises those inherent to herbal drugs, and discusses issues of plant identification and medical treatment, as well as the specifics of animal poisoning, particularly in pets. The inventory of the most significant clinical data are grouped in Part 2 which is a detailed discussion of the plant species most often at fault, including the