

## Book reviews

**Robert N. Trigiano and Dennis J. Gray, editors. *Plant Development and Biotechnology* (2005, CRC Press LLC, Florida, USA) (xiv + 358pp., £49.99, ISBN 0-8493-1614-6)**

Plants photosynthesis—plants use chlorophyll to trap sunlight, which plants use as their energy source and utilize photons to convert water to oxygen and hydrogen. Plants take up carbon dioxide and produce oxygen, water and sugar. Different plants have different uses. Today, technology can be used to grow healthy plants.

*Plant Development and Biotechnology* is split into five sections, which are further split into chapters. Section 1 provides an introduction and gives an overview of what the book entails. Section 2 titled ‘History of plant tissue and cell structure’, just details how studies and research have developed concerning plant tissue culture. Section 3 titled ‘Supporting Methodologies’, concerns plant tissue culture laboratories, and discusses how they have different areas for different functions, and explains how the tissue culture media should be prepared and how the tissue culture media is to be sterilized. Plant cells need an ‘ideal medium’ for growth; this medium can provide a good atmosphere for bacteria and fungi to grow, which needs to be prevented. Media can be sterilized in tissue culture vessels and equipment can be sterilized in an autoclave. Histological techniques are described. Discussed are the histological techniques for the study of plant tissues using paraffin/plastic media. The equipment, materials and methods are listed and explained. The general steps are fixation, dehydration and infiltration, casting specimens into blocks, microtomy and mounting sections on slides, staining sections, immobilization of specimens for paraffin sectioning, dissection and mounting of specimens, preparation of specimens for scanning electron microscope (SEM) and chromosome counting. In this section, photographic methods for plant cell and tissue culture explained as plant cells and tissue culture are based on visual observation. The elements in plant tissue culture research are introduced in this section. This is followed by an introduction to plant anatomy. Plant cell types are described; the different types of cells found are meristematic cells, parenchyma cells, collenchyma cells and sclerenchyma cells. Then the four plant organs: roots, stems, leaves and flowers are described. Then the role of plant growth regulators in plant tissue culture and development are explained. Computer systems now can help researchers with their research and systems have been developed that can analyse and manage sequences of genes, genetic elements/proteins. These computer systems now play a major role in molecular biology and genetic engineering. These are all discussed in this section. Then following this, discussed

are the molecular approaches to the study of plant development.

Section 3 titled ‘Propagation and development concepts’, discusses shoot culture (micropropagation) procedures and organogenesis, molecular aspects of in vitro shoot organogenesis, nonzygotic embryogenesis and developmental embryogenesis and molecular aspects of somatic.

Section 4 details crop improvement techniques, firstly is discussed how plants are used for plant improvement. Protoplasts can be obtained from many plant tissues and cultures; protoplasts are plant cells without a cell wall and can be obtained using hydrolytic enzymes to digest cell wall components. Haploid cultures are discussed: androgenesis, and gynogenesis. Embryo rescue is detailed; this is when a immature/weak embryo grows into a viable plant. Followed by this, genetic engineering technologies are described. Genetic engineering involves transfer of foreign DNA into plant cells some that are detailed in this book as follows: agrobacterium-mediated transformation, protoplast-mediated transformation, microprojectile bombardment and alternative direct DNA transfer plants grown by the forms of genetic engineering are known as transgenic plants. Particle bombardment has become quite a popular method for transfer of DNA; it is done by the use of particle guns and this is detailed in this section. Then described is a simple illumination system for visualising green fluorescent protein, this is a marker which can detect the transgenic cells in a plant. Germ-plasm preservation for a crop is of different genotypes that can be used for improvement; this is discussed and details of preservation of seed-propagated species, preservation of pollen and preservation of vegetatively propagated species cryopreservation. Products can be produced from in vitro plant tissue cultures; medical and industrial compounds are described.

Section 5 titled ‘Special topics’, covers any other topics related to the book, and includes ‘in vitro plant pathology’, and discusses variation in tissue culture and commercial laboratory production; products must be produced to a very high quality and healthy plant material must be made quickly and as cheaply as possible. All factors concerning lab production of materials are discussed. Standards have been set for producing plants and discussed for indexing plant pathogens is health certification of plants, pathogen indexing in vivo, diagnostic methods, multiplexing, detection and identification of viruses and viroids and bacterial plant pathogen and fungal plant pathogen. This book concludes with information on entrepreneurship biotechnology ventures and details on all the information to setting up a business and explains the standard protocols and systems for research groups, and details the five section to starting up a business: planning, personnel, legal filings, capital and start-up.

This provides a good understanding and knowledge of plant development and biotechnology. The text is supported by illustrations and tables and would be found useful to persons studying plants and researching into the future of biotechnology concerning plants.

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**I. Molnar-Perl, editor. Quantitation of Amino acids and Amines by Chromatography: Methods and Protocols, Elsevier B.V, Amsterdam, The Netherlands, 2005 (xii + 655 pp., £170.00, ISBN 0-444-52050-3)**

Analytical techniques play a very important role in all the scientific and technological processes. Science has witnessed a rapid expansion of all types of analytical methods, and different instruments have come into picture with the advancement of technology. This rapidly growing area has led to the development of techniques, which are highly sensitive, accurate and less time consuming. Different chromatographic techniques have become popular analytical techniques for the qualitative and quantitative determination of a wide range of substances. The wide choice and sophisticated columns, detectors, derivatization procedures, the development of modern instrumentation and data handling systems have reduced time and costs, and give versatility, sensitivity and reproducibility. *Quantitation of Amino acids and Amines by Chromatography: Methods and Protocols*, volume 70<sup>th</sup> of Journal of Chromatography Library series, provides a wide range of chromatographic techniques for the identification and quantification of amino acids and amines in various matrices.

Amino acids are important biological compounds building peptides and proteins, and exist in foods, feeds, body fluids and tissues. The chirality of amino acids plays an important role in many fields of biosciences including synthetic peptide chemistry and peptide drug design. Therefore, the separation and detection of chiral amino acid has become an interesting and important research topic. Amines are organic compounds, which are of significant concern with respect to series of chemical and biochemical processes. For this reason their determination in a wide range of matrices including biological fluids and tissues, natural products, foods and related products or environmental samples is of particular importance. A considerable number of chromatographic based methods have been developed to make accurate determinations of amino

acids and amines. Part 1 and Part 2 of the book is focussed on the quantitative determination of amino acid, and amines, respectively by different chromatographic techniques. Different chromatographic techniques such as gas chromatography, high performance liquid chromatography and capillary electrophoresis/capillary electrochromatography have been described. Subsections deal with the analysis of compounds in natural form, followed by various derivatization protocols.

An overview of quantitation of amino acids and amines simultaneously, is presented in chapter 3. The recent developments in polyamine analysis by chromatography are summarized in the last chapter. A substantial part of this chapter is devoted to the most important biogenic polyamines, and some attention is given to synthetic polyamine polymers.

This volume provides an overview of theory and protocols along with chromatograms of various chromatography techniques. In conclusion, this volume can be useful guide to the students, academia, researchers, practitioners and consultants working in environmental testing laboratories, food and pharmaceutical industry.

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**R. Breslow, editor. Artificial Enzymes, Wiley/VCH Verlag GmbH & Co. KGaA, Weinheim, Germany, 2005 (xii + 181 pp., £55.00, ISBN 3-527-31165-3)**

Enzymes, also called biocatalysts have wide range of potential applications in various industrial processes. These macromolecules have fascinated scientists and technologists for many decades. Although chemical synthesis and recombinant technologies have made many enzymes available for medical and biotechnological applications, the design of artificial protein catalysts for tasks unimagined in biology remains a challenging work. The properties of artificial enzymes help us understand the special properties of nature's enzymes. The great challenge in achieving, with artificial enzymes, the huge rate accelerations that the best natural enzymes can achieve make us think more deeply about the natural enzymes. With the advancement in modern science, diverse strategies for creating new enzymes have been explored.

The book on *Artificial Enzymes* describes the various approaches to the synthesis and study of artificial enzymes. The book opens with a chapter on artificial enzymes, which covers