

## Book reviews

**Meeuse, B.; Morris, S.: The Sex Life of Flowers.** London, Boston: Faber and Faber 1984. 152 pp., several figs. and tabs.

This book, based on the television documentary "Sexual encounters of a floral kind", is presented with deep knowledge, passion and enthusiasm. Though it is aimed at a "layman, naturalist" readership it is also good reading, providing information and enjoyment for the non-specialist scientist.

The book begins with evolutionary inferences of the ways by which modern flowering plants achieve pollination. This theme is followed by a short, balanced and convincingly written presentation of flower biology, and pollination mechanisms and dynamics based on borrowed mobility. Chapter 3 reviews mechanisms promoting allogamy. Adaptation and coevolution of floral strategies and biotic pollen dispersal agents up to the mutual dependence of animals and plants is well detailed in its diversity of biotic pollination syndromes. How plants may achieve pollination by deception and foul means, and how animals may illegitimately remove reward substances from plants without reciprocating by pollination, is portrayed in the chapter titled "The unacceptable face of pollination". The chapter on abiotic pollen vectors is a nice, well-balanced presentation briefly referring to self pollination, anemophily and hydrophily. In a book aimed towards a novice readership I missed in the chapter on "Pollination and mankind" a mention of the economically most significant contribution gained from our knowledge in pollination biology, i.e. methods for hybrid seed production and hybrid breeding based on utilisation of pollination mechanisms. The glossary given at the end of the book is somewhat sketchy, but accurate. "Further reading" gives a list of well-selected references for each of the chapters; these are in a few cases somewhat subjectively chosen to support points made in the text which are still controversial. The index is quite useful for picking out examples while returning to the book for reference.

There is a definite attempt in the presentation to integrate facts (and also of beliefs) into a beautiful harmonic picture that "makes sense". The text is precise with a few compromises and analogues made to simplify comprehension by the layman. Errors are limited to the inaccurate or archaic usage of some terms, such as the use of "parthenogenetic" (p. 134) for the development of seedless fruits – a term which should be restricted to the development of virgin ("parthenos") embryos – or the use of the outdated *Solanum lycopersicum* (p. 57) instead of *Lycopersicon esculentum* for the tomato.

As is to be expected, the book is beautifully and effectively illustrated. A minimum of technical terms is used. The text abounds in lucid terms and statements of a somewhat superlative journalistic flavor. All in all, this is a nice little book featuring a large, beautifully illustrated format for the curious novice in pollination biology and for those biologists who like a fascinating story retold again and again by a versed and enthusiastic story teller.

R. Frankel, Bet-Dagan

**Hansen, J.: Practical Manuals for Gene Banks, No. 1. Procedures for Handling Seeds in Gene Banks.** Rome: Internal Board for Plant Genetic Resources 1985. 115 pp., 23 figs. and 3 tabs.

The IBPGR has already published a tri-part handbook for gene banks which concentrated on principles, methodology and test recommendations. This new series, a practical guide to suitable methods for the processing and storing of seeds in gene banks is intended for technicians involved in the daily handling of seeds. It explains in a simple way the practical procedures for the registration, cleaning, determination of moisture content, drying, conducting of viability tests, packing, and storage and monitoring of accessions, according to the scientific standards worked out for both base and active collections defined by the IBPGR Advisory Committee on Seed Storage. All the techniques outlined are standard ones which have been tried out and tested in gene banks. This basic guide is completed by appendices, which indicate additional references, a glossary to technical terms, a list of suitable equipment for use in seed banks, as well as list of experts to be contacted for advice if necessary. This useful book is written in a clear, concise manner and will contribute to the improvement of genetic resources centers in building up plant germ plasm stations. It is surprising that no remarks are spent on seed grading and picking procedures. Maybe they will be included in the next volume.

H. F. Linskens, Nijmegen

**Graveland, A.; Moonen, J.H.E. (eds.): Gluten Proteins. Proc 2nd Int Workshop Gluten Proteins.** Wageningen, The Netherlands, 1–3 May 1984. Wageningen: Institute for Cereals, Flour and Bread TNO 1985. 218 pp., many figs. and tabs. Soft bound \$ 15,-.

The intensive research on gluten biochemistry and genetics during recent years has prompted the need for a periodic review and discussion of the accumulating information, with a strong emphasis on its application for plant breeding and the food industry. This book is the proceedings of the second international workshop, summarizing major developments in this line of research since the first workshop, held in 1980. The book contains 22 papers covering the following aspects of gluten proteins: (a) techniques of chemical analysis, including reversed-phase high-performance liquid chromatography (HPLC), extraction and fractionation methods, sequential solubilization and the use of monoclonal antibodies for detection of specific gluten subunits; (b) chemical characterization of gluten, its structure, conformation and aggregation studied by classical approach of protein chemistry combined with the newer techniques of molecular biology and computer prediction of secondary structure; some of these properties are discussed in relation to bread-making quality; (c) genetic control of endosperm proteins and structure of genes that encode major gluten proteins.

The unique position of wheat among cereals depends on its capability of gluten formation. Gluten, consisting of the seed storage proteins of wheat (mainly glutenins and gliadins), is one of the most complex proteins in plants. The separation of individual protein subunits by improved electrophoretic techniques facilitated the study of their amino acid composition, structure, properties and genetic control, as well as the establishment of the relationships between individual gluten proteins and their nutritional and technological properties. The book presents several models of gluten structure ex-

plaining the viscoelastic properties of dough which are assumed to be determined by the glutenins (elastic properties) and the gliadins (viscous properties). Hypotheses on the role of disulphide bonds in the mode of aggregation of glutenins as well as the interaction of gliadins and glutenins with lipoproteins, lipids and carbohydrates in the formation of the gluten complex, is discussed.

Coupling genetic studies with improved methods of protein fractionation has facilitated the study of the genetic control of seed storage proteins. Several papers, utilizing these methods, discussed the recent progress made in this area. Much information is reviewed concerning the genes that encode for storage proteins which are clustered at several loci on chromosomes of groups 1 and 6 of common wheat. New possibilities for research on the structure and mode of regulation of some of these genes became available with the successful isolation of cDNA clones of the major classes of gluten. Complete sequences of proteins encoded by these clones can be expected in the near future.

It is regretful, however, that no general agreement was reached concerning the definitions or nomenclature of the various gluten proteins as well as of the genes encoding them. This is presumably the result of the incomplete understanding of the composition and structure of gluten on one hand and the interdisciplinary nature of the research on the other hand.

The proceedings may be a great asset to all those interested in the chemistry, genetics and food technology of gluten proteins.

M. Feldman, Rehovot

**Higgins, I.J.; Best, D.J.; Jones, J.: *Biotechnology, Principles and Applications*.** Oxford, London, Edinburgh, Boston, Palo Alto, Melbourne: Blackwell Scientific Publications 1985. XI+422 pp., several figs. and tabs.

Three major factors are responsible for the present "biotechnology boom": 1) the recent technical developments in biocatalysis, immunology, fermentation, bio-electrochemistry, and especially in genetic engineering; 2) the predicted importance of biotechnology-based products and services which may have share in the increase of the quality of life and thus may radically affect humanity in the (near) future; and 3) the increasing willingness of scientists to integrate very different scientific disciplines and to cooperate. A successful example of such cooperation is found in the present book. Seventeen specialists contributed with the aim of providing an introductory textbook to contemporary biotechnology for senior undergraduates and postgraduates in the fields of biochemistry, microbiology, chemical engineering, environmental and agricultural biology, and medicine. The book will also be of general use for becoming familiar with the ramifications of biotechnology.

The design of the book is logical. The division into nine chapters is dictated by the problems and interests of society: energy (biogas, ethanol), food-stuffs (treatment and preservation, additives, enzymes and processing, single cell protein), the environment (monitoring, treatment of xenobiotics and wastes), agriculture (selection, plant and animal breeding), genetics (genetic engineering), medicine (diagnosis, manufacture of drugs and antibiotics, therapy), materials (mineral extraction, biodeterioration), chemistry (organic acids, chemicals from biomass, detergents), and chemical engineering (microbiological production processes). These chapters follow an introductory chapter in which the complex nature and the main future prospects of biotechnology are described and explained. However, since the present "biotechnology boom" is mainly the result of recent progress in genetic engineering, a

separate chapter about molecular biology in relation to biotechnology would not have been out of place.

The well-prepared book is very informative mainly in its description and explanation of the biotechnological principles and applications. Unfortunately, only a few chapters provide a summary and give a link to the future; some chapters conclude with a list of recommended literature which is not always up-to-date.

Future editions of the book will undoubtedly show the increasing multi-disciplinary character of Biotechnology.

L.J.W. Gilissen, Wageningen

**Hames, B.D.; Higgins, S.J. (eds.): *Nucleic Acid Hybridisation (a Practical Approach)*.** Oxford, Washington DC: Irl Press 1985. XV+245 pp., several figs. and tabs. Soft bound £ 14.00.

"Nucleic acid hybridisation" is the most recent volume in the Practical Approach Series. As such it deals with the various aspects of the formation of a duplex between two complementary nucleotide sequences, all of the techniques involved finding widespread use in modern biology. The book provides eight chapters, each by an expert or group of experts in the field, together with an appendix dealing with restriction enzymes, nucleic acid size markers, and computer analysis of nucleic acid hybridization data. The latter are also by experts in the field. The primary aim of the book is to provide detailed practical protocols for the major hybridization procedures. However, the authors have also provided theory, rationale and practical advice throughout, in the knowledge that a procedure needs also principles and theoretical background before it can be applied to a particular problem in biology.

Following an Introduction by E.W. Southern, the first chapters deal with hybridization strategy, preparation of nucleic acid probes, quantitative analyses of solution hybridization and quantitative filter hybridization. While solution hybridization is the method of choice for quantitative measurements of sequence complexity and composition, there are practical difficulties when the number of samples is large. This is where the filter hybridization (dot blot) comes into its own for analysis of multiple samples. After the treatment of dot blot techniques, appear chapters on hybridization in the analysis of recombinant DNA and then in the analysis of RNA. Finally, the book is completed by a chapter on electron microscope visualization of nucleic acid hybrids and then on *in situ* hybridization. All chapters give extremely well described experimental procedures, are well illustrated, and contain a nucleus of references for each of the areas covered. An index is to be found at the rear of the volume.

A book which should be useful to both those using the techniques for the first time, and to those who have some experience in the area, it is recommended for your laboratory bookshelf.

J.F. Jackson, Glen Osmond

**Pritchard, R.H.; Holland, I.B.: *Basic Cloning Techniques, A Manual of Experimental Procedures*.** Oxford, London, Edinburgh, Boston, Palo Alto, Melbourne: Blackwell 1985. IX+193 pp., several figs. and tabs. Soft bound £ 11.80.

This manual is designed for undergraduate practical courses in cloning techniques. It was written by those who put on such a course in the University of Leicester, England, and who therefore have first-hand knowledge of both the subject matter and the way in which it is put to students. A knowledge of microbial techniques and basic microbial genetic skills is assumed, and to this end some important references are included in case of deficiencies in this area. DNA sequencing

is not covered by the course, the authors suggest this is better carried out as a demonstration.

The experiments are set out in protocol form, and the time needed to perform them indicated. The manual is divided into five sections, dealing with in turn mammalian cDNA cloning, analysis of DNA and RNA, DNA-dependent gene expression systems, bacteriophage  $\lambda$  as a vector and electronmicroscopy of nucleic acids. Within each section there is an introduction, and then several experiments are described each with background information liberally illustrated and referenced, a list of materials needed, procedure description and, finally, if necessary, concluding remarks or analysis and interpretation comments. An adequate Index concludes this very useful book.

Although the authors indicate the manual was written by several groups, this is not evident from the text, which is presented in a uniform style and layout. The entire course in cloning techniques can be fitted into a 2-week intensive period by running different sections of a complete procedure in parallel; this was the way in which the course was conducted at the University of Leicester. Alternatively the course can be carried out over a longer period and in sequence. The number of strains of bacteria required and their plasmids, as employed in the course, is not large. Most are widely used and available in most parts of the world. The authors have indicated they are willing to supply such strains and plasmids which are not available locally to those using the manual.

In short, a practical, extremely usable manual for those undertaking an undergraduate course in cloning techniques.

J. F. Jackson, Glen Osmond

**Gething, M.J. (ed.): Protein Transport and Secretion. Current Communications in Molecular Biology.** New York: Cold Spring Harbor Laboratory 1985. 215 pp., several figs. and tabs. Soft bound \$ 30.00.

We are used to the Cold Spring Harbor Laboratory hosting conferences on topical subjects and bringing together the right experts for such a meeting. They have done it again with the topic "Protein transport and secretion" and, what is more, have produced in good time an excellent volume with reports from those giving papers at the Conference. The topic covers studies on the transport of proteins in both prokaryotic bacterial, yeast and mammalian systems. It covers two main areas. The first being the analysis of the cellular structures and processes involved in the biosynthesis, maturation and directional transport of membrane and secretory proteins; the second, the molecular analysis of domains of proteins that are required for their transport through the cell.

An introduction by M.J. Gething sets the scene for protein secretion, both the development of research in this area, and the future trends are dealt with. The book is then organized into five sections, the first dealing with translocation of proteins across the lipid bilayer. Ten reports are included in this section, each four to six pages long containing the essential features of papers presented to the meeting. The remaining four sections cover "transport from the endoplasmic reticulum to the plasma membrane", "structures involved in transport and endocytosis", "directed transport in mammalian cells" and finally "directed transport in yeast".

While this volume, as one in the series "Current Communications in Molecular Biology" from Cold Spring Harbor, provides through these reports an up-to-date appraisal of the latest in protein secretion and transport research, it does suffer from two deficiencies. These include the lack of an index and the failure to include any substantial reference to the topic in plant cells. Notwithstanding this, the volume does give those

interested in this topic a good idea of recent advances in microbial and animal protein secretion.

J. F. Jackson, Glen Osmond

**Streilein, J.W. et al. (eds.): Advances in Gene Technology: Molecular Biology of the Immune System. Proc 17th Miami Winter Symp, Miami, Fla, USA. February 11-15, 1985.** Cambridge, London, New York, Sydney: Cambridge University Press 1985. XXI + 366 pp., several figs. and tabs. Hard bound £ 30.00.

"Molecular Biology of the Immune System" contains the proceedings of the 17th Miami Winter Symposium held from February 11-15. It is the second volume in the series of ICSU short reports: Advances in Gene Technology. The first part of the book contains the symposium presentations of 28 invited speakers and is subdivided into seven areas of interest: immunoglobins, major histocompatibility complex, interleukins and mediators, T cell receptor, complement components, cell surface markers and immune networks. The second part contains 128 poster presentations.

Each of the symposium presentations is intended to be a complete and original communication that may be cited in the literature. For most of the contributions this is true; they contain new experimental data presented in figures and tables and have a maximum length of four pages including the references. However, some of the papers are not more than an abstract or a mini review and contain little or no new information. On the whole the papers give a good review of the tremendous progress in the field of immunology. They demonstrate thoroughly the impact modern recombinant DNA technology and molecular biology have on this field. They also show that the boundaries between different fields in science are becoming more and more vague. The papers presented here are not only interesting to researchers in the field of immunology but also to those in molecular genetics, especially those who are interested in recombination and gene expression.

The poster session reports are not subdivided into issues as the presentations of the invited speakers are. They are 2 pages long and cover a variety of subjects, most of them containing detailed experimental data presented by figures and tables. Poster presentations are in this way more valuable than when they are only presented as an abstract in proceedings.

The book has an author index but lacks a subject index. The latter is especially missed for the poster presentations as they are therefore not well accessible for the reader. This book, also a source of recent literature, will be a valuable asset to researchers in the field of immunology and molecular biology.

A. van der Ende, Utrecht

**Leng, R.A.; Barker, J.S.F.; Adams, D.B.; Hutchinson, K.J. (eds.): Biotechnology and Recombinant DNA Technology in the Animal Production Industries (Reviews in Rural Science 6).** Armidale, Australia: University of New England 1984. 226 pp., several figs. and tabs.

This volume brings together papers presented at a conference on biotechnology in animal production systems held at the University of New England, Armidale, Australia. A very holistic approach has been taken. The book covers new biotechnologies with potential application to the whole of animal production. There are several chapters on hybrid DNA techniques which are or may shortly be fruitfully used in animal and plant breeding, and in the production of vaccines.

The use of immunology in reproduction research is discussed in one interesting paper by R.J. Cox, P.A. Wilson and

M. Wong. The potential of manipulating the microbial composition of the rumen is dealt with in a section of five papers. One rather large section is devoted to biotechnologies for the improvement of soil fertility. Though interesting on their own merit I find some of the papers in this section, e.g. the one on the role of earth worms, a little off the main track in a text related to animal production systems. On the whole, however, the book provides interesting reading. It may hopefully provoke the narrow specialist in one area of the animal production system to read texts related to other specialities in the overall system.

J. Rendel, Uppsala

**Glover, D.M. (ed.): A Practical Approach, Vol. 1. DNA Cloning.** Oxford, Washington DC: Irl Press 1985. XIV+190 pp., several figs. and tabs.

Now that techniques of molecular cloning have become applicable in numerous fields of biological science, there is an increasing demand for method books written in the "cook-book" style and containing improved experimental protocols.

Four years ago the Cold Spring Harbor Laboratory published such a collection, "Molecular Cloning: A Laboratory Manual" by Maniatis, Fritsch and Sambrook, which is widely accepted as an invaluable source for a variety of molecular cloning techniques. However, all the techniques described in "Maniatis et al." are restricted in application to *Escherichia coli*, and furthermore, in the last four years since its appearance there have been new developments in most molecular cloning techniques. According to the introducing remarks written by the editor of the new series, D.M. Glover, "DNA Cloning: A Practical Approach" is planned "as a book that would not duplicate but rather extend and complement" the "Maniatis Manual". It is a credit to the editor of the new series that the book completely fulfills this expectation. New Lambda vectors that permit the direct selection of recombinants (Kaiser and Murray) and which have been shown to be useful for c-DNA cloning (Huynh et al.; Watson and Jackson) are described in the first chapters. In addition, effective transformation methods (Hanahan), new plasmid (Dente et al., Franklin) and phage vectors (Fritz) and some other subjects are discussed in this volume.

R. Borriess, Gatersleben

**Glover, D.M. (ed.): A Practical Approach, Vol. 2. DNA Cloning.** Oxford, Washington DC: Irl Press 1985. XIII+245 pp., several figs. and tabs.

The second volume of "DNA Cloning: A Practical Approach" describes host-vector systems other than those of *E. coli*. There is without a doubt a need for a laboratory manual applying well-known *E. coli* R&D techniques to other potential cloning systems. Some of the most important pro-

caryotic and eucaryotic host-vector systems are covered in this second volume.

Gram-positive bacteria such as *Bacillus* and *Streptomyces* have been proven useful for expressing extracellular protein genes. In addition, both organisms have attracted special interest because of the presence of developmental-regulated gene expression caused by alternative sigma-RNA polymerase factors (Hardy: *Bacillus* cloning systems; Hunter: Gene cloning in *Streptomyces*). Chapter III covers different gene cloning methods in yeasts (Rothstein).

It is probable that a universal host-vector system allowing the expression of all eucaryotic genes doesn't exist. In comparison to plants and animals microbial host-vector systems show some differences at the post-transcriptional and post-translational levels. Therefore, most of the space in this volume is dedicated to methods of genetic engineering in plants (Lichtenstein and Draper), *Drosophila* (Karess) and mammalian cells (Gorman), including animal host-vector systems (Mackett et al.; Campo). This volume doesn't realize the "Maniatis style"; the intention is to lead the reader through some concepts and techniques applicable to cloning in alternative host systems.

R. Borriess, Gatersleben

**Feramisco, J.; Ozanne, B.; Stiles, C.: Growth Factors and Transformation. Cancer Cells/3.** New York: Cold Spring Harbor Laboratory 1985. 450 pp., several figs. and tabs. Soft bound \$ 70.00.

There are many publications on cancer research. The aim of the reported conference was to bring together those researchers studying oncogenes with those investigating growth factors. These are two areas of research that have rarely been included in the same meetings. Recent observations indicate that initial events induced by growth factors, such as nutrient and ion transport or calcium mobilization seem to be altered by oncogenes. This and other results suggest that the growth-promoting activity of growth factors and oncogenes seemed to be functioning along common pathways. It is therefore significant that workers in the areas of epidermal growth factors, transforming growth factors, insulin-like growth factors, platelet-derived growth factors, lymphokines, kinases, and oncogenes discuss together problems of cancerogenesis. The papers reveal the progress which has been made in identifying both growth factors and oncogenes controlling cell proliferation. Even today, however, little is known at the molecular level about their functions and modes of action. Therefore, in the future the biochemistry of cell proliferation will become increasingly more important. The present papers provide new insights into the mechanisms of cancerogenesis and offer a good basis for further investigations in these fields.

H. Stäber, Berlin