

## Book reviews

**Hacket, P. B.; Fuchs, J. A.; Messing, J. W. (eds.): An Introduction to Recombinant DNA Techniques.** *Basic Experiments in Gene Manipulation, 2nd Edn.* Menlo Park: The Benjamin Cummings Publishing Co 1988. 243 pp., 57 figs., 5 tabs. Soft bound.

*An introduction to recombinant DNA techniques* is a manual for a course on gene cloning. In the first part of the book the authors draw together the basic principles of gene cloning, which includes general information about the use of *E. coli*, a description of the three cloning vectors most commonly used, and some ideas on sequencing DNA. Part two is devoted to the laboratory exercises. This part is divided into 20 laboratory sessions, which include, after a brief introduction to the techniques, the materials, procedures, and some notes and questions.

The experiments described in this manual introduce the reader to different techniques for gene cloning using three vectors: lambda phage, plasmids and the single-stranded DNA phage M13. The procedures show how to select different *E. coli* genes, how to subclone them in the vectors, and how to obtain their sequence. The protocols are presented in detail, and the experiments are designed to be nonhazardous and quite inexpensive.

The latter part, formed by six appendices, completes the book with a description of the preparation of the solutions, reagents, and equipment used in the course as well as some notes on DNA analysis by gel electrophoresis, DNA ligation, and restriction enzymes.

A variety of students and teachers will find this book a useful addition to their libraries. Contrary to what is expressed in the introduction, the authors appear to direct their interest towards the experiments described in the second half of the book, which results in a loss of perspective of the problems that one encounters in a normal situation. The experiments described seem effective, reproducible, and reliable, but on these points it would be better to consider the opinion of a laboratory instructor or student.

In conclusion, this book is a valuable manual for a gene cloning course, but for general training there are other references theoretically more complete, such as *Basic methods in molecular biology*, by L. G. Davis, M. D. Dibner and J. F. Battey, 1986, Elsevier Science Publishing Co, which is a valuable text not cited on the references. A. Olmedilla, Nijmegen

**Schwintzer, I. (ed.): Das Milchschaft.** Stuttgart: Ulmer 1988. 208 pp., several figs. and tabs. Soft bound.

In the scope of man's growing interest in keeping sheep, either a few or many, as domestic animals, the aim of this book is to answer revealing questions faced by both the beginning and experienced sheepkeepers. The book introduces a range of subjects on sheep-breeding. The author, Ida Schwintzer, is a well-known authority in the field of sheep-farming. The chapters span a range of topics, including sheep behaviour, breeding, diseases and their prevention, and the wool, meat and milk as products from sheep-farming.

The first chapters describe how sheep are descended, what properties were obtained by inheritance, changes in characteris-

tics due to crossing and the various breeds existing at present times. The differences in behaviour between black and white sheep are outlined in more detail.

In addition, questions as how to start a sheep farm are answered. Ample information is presented on the quality of the various stocks or races in milk sheep, the advantages of these different stocks, and what a sheepkeeper may expect after choosing one stock or another. Other chapters include advice for optimal housing, the demands for food, and the importance of balanced diets for the healthiness of the animals and the quality of their products.

The birth of lambs and their early experiences are excellently described. In particular, the schematic drawings on all stages during birth are very illustrative. After some words about diseases and their symptoms, an overview of all products from milk sheep is given.

This is no ordinary textbook to be stored in a library, but a "worker"-handbook. The photos, diagrams, and drawings are excellently printed. The combination of illustrations and textual evidence will certainly help the sheepkeeper to create optimal conditions for a successful and enjoyable stay with his sheep.

The language is German, the style is accessible and lucid, and the presentation is very pleasing. The author can be congratulated for assembling such a useful book.

A. M. Blom-Steinbusch, Vianen

**Caspari, E. W.; Scandalios, J. G. (eds.): Advances in Genetics, Vol. 25.** San Diego: Academic Press 1988, 319 pp. \$ 55.00.

Reviewing reviews can be boring – it is just like extracting extracts. As a result I will restrict myself to just mentioning the topics which were reviewed: the evolution and genetic regulation of transferrin expression (B. H. Bouwman, F. Yang, G. S. Adrian) – a promising model about gene modulation; the alcohol dehydrogenase gene-enzyme system in *Drosophila* (G. K. Chambers) – popular among geneticists for studying the principles that govern gene regulation in higher organisms; genetic research on Braconid wasps (D. S. Grosch), famous because of its inclusion in the Biosatellite program – an excellent review that was revised and finished by R. M. Pette; the organization, mutational alteration and expression of the variable mitochondrial genome of Ascomycetes (K. Wolf, I. del Guidice), a small target with a huge controller. This latter topic was discussed in an overview with over one thousand references – a tremendous work of compilation.

Once again the active editors have been able to find hot topics and enthusiastic reviewers to help keep the poor academic teachers up-to-date. Hopefully the latter will be able to integrate this progress into their teaching. H. F. Linskens, Nijmegen

**Cech, Th. R. (ed.): Molecular Biology of RNA.** *UCLA Symposia on Molecular and Cellular Biology. New Series, Vol 94.* New York: Alan R. Liss XVII+392 pp., several tabs. and figs. Hard bound \$ 80.–.

Reading a book entitled *Molecular Biology of RNA* is not an easy task, in particular because the book deals with a wide spectrum of papers presented at the UCLA Symposium on the

Molecular Biology of RNA. The topics described in this book range from RNA chemistry through biochemistry to developmental biology. It is almost impossible to discuss all the various topics that are presented. They range from structural aspects to RNA catalysis, RNA-protein interaction, processing, translation, regulatory aspects, ending with evolutionary aspects. Some aspects of differentiation and development are handled in chapters dealing with alternative RNA processing in differentiation and antisense RNA.

For anyone dealing with RNA as more than an intermediate between DNA and protein, this book contains much interesting information that represents the most updated knowledge of the very broad range of research aspects of RNA. Researchers, teachers, and students will find *Molecular Biology of RNA* a very valuable book about a rapidly developing area.

G. J. Wullems, Nijmegen

**Key, J. L.; McIntosh, L. (eds.): Plant Gene Systems and their Biology. *ULCA Symposia on Molecular and Cellular Biology, New Series, Vol. 2.*** New York: Alan R. Liss 1987. I-XVII, 415 pp., 97 figs.; 16 tabs. Hard bound \$ 76.00.

One of the best presentations of our knowledge of plant gene systems in recent times, this book brings together such diverse subjects as flower induction, fertilization, developmental and stress-regulated gene expression, enzyme-gene systems in metabolic regulation, transgenic expression and promoter analysis and molecular modification of the photosynthetic apparatus. In fact, these topics make up the six sections in the book, and within each section resultant biology is discussed.

Thus the old problem of plant physiology, that of flower induction, is brought to life in the first section on reproductive biology. The possible role of hormones and the need for a careful molecular biology approach are emphasized, and herald a new surge in research on floral induction. The molecular aspects of self-incompatibility are presented in the second reproductive biology section, as well as cytoplasmic male sterility and apomixis, the latter two topics being of great commercial interest.

Stress regulation and the various gene systems are the subject of the third section; these systems are of great interest in many laboratories around the world. Both heat shock and salt stress gene systems have received much attention, as well as the possibilities of genetic engineering of crops – both from the point of view of protection from insects and resistance to herbicides.

The molecular basis of the observation that different isozymes of glutamine synthetase are to be found in different subcellular locations within the plant is one of the many chapters making up the section on enzyme-gene systems. The book is rounded off by several chapters on transgenesis in tobacco and petunia and possibilities for cereal crops, as well as the molecular biology of chloroplast-gene systems. The latter includes consideration of the complex interplay between nuclear and chloroplast gene expression. The book has an extensive and useful index, and great use has been made throughout of illustrations and tables.

I recommend this book to all those interested in the molecular biology of plant cells. The Editors have produced a volume which presents not only the latest molecular biology, but also the practical implications of some of this research.

J. F. Jackson, Glen Osmond

**Gepts, P. (ed.): Genetic resources of *Phaseolus beans*.** Current Plant Science and Biotechnology in Agriculture. Kluwer 1988. 613 pp. \$ 138.50.

*Phaseolus*, a new world crop which is cultivated and consumed in the tropics, subtropics and temperate zones is the staple food crop in many regions. In addition to being the chea-

pest source of high levels of seed protein, this plant has many versatile biological traits, including predominant autogamy, large seeds, presence of gene-cytoplasmic male sterility and a short growth cycle (2.5–5 months) in temperate climates. When *Phaseolus* is cultured in the greenhouse, as many as four generations per year can be obtained; however, this shortened life cycle reduces seed yield and significantly increases the cost of seed production. While a great deal of the work on the genetics and breeding of this crop has been published, the available literature seems to be scattered about in journals and sources that are not easily found at short notice. Therefore, the appearance of this compilation is very timely.

This book contains 23 chapters written by 29 authors, all very well-known scientists in bean research, and is classified into five sections: (1) *Phaseolus* germ plasm exploration and maintenance (6 papers); (2) Domestication and evolution of *Phaseolus* with special reference to *P. vulgaris* (5 papers); (3) Genetics of *P. vulgaris* (4 papers); (4) Genetic resources, domestication and evolution of other cultivated *Phaseolus* species (3 papers); (5) Utilisation of *Phaseolus* genetic resources (5 papers).

Colour plates present towards the end of the book vividly reveal the extent of the tremendous variability in seed form and in the shape, colour and size of the seed of beans from South America, Latin American countries, and from the African country of Malawi. Various phenotypic and genetic markers of bean are also depicted by the colour plates.

A perusal of the chapters of this book reveals that as yet we have no understanding of the genetic control of most of the traits in *Phaseolus*: only 32 genes have been quantitatively mapped in *P. vulgaris* so far. In order to locate genes special cytogenetic stocks, such as a primary trisomic series, translocation testers and meiotic mutants, are necessary, and these are lacking in beans. More stainable isozyme loci (only 12 are known so far) and DNA restriction markers for precise genetic analysis are immediately needed. When a complete primary trisomic series becomes available, molecular markers (e.g. DNA restriction fragments) could be oriented into the genetic maps efficiently and rapidly. The resulting linkage map would assist in determining if interspecific genetic recombination has taken place or not. Moreover, many different gene symbols are assigned by various geneticists to the same gene. This indicates a lack of coordination among bean geneticists. Hence, there is a big task ahead for the gene nomenclature committee – to list the genes and assign gene symbols after genetic tests as is being done in maize, tomato, barley, wheat, pea etc. Many spontaneous and induced mutants of bean have been reported, but most of the seed of the mutants has been lost and is not available to the various germplasm collection centers listed in this book.

Despite the many useful facts presented in the book, it has its limitations: a biotechnological approach to *Phaseolus* improvement is lacking, even though it is published under the series *Current Plant Sciences and Biotechnology in Agriculture*. The book lacks information on studies conducted on quantitatively inherited traits, their heritability and genetic advance, interrelationships (genetic, environmental and phenotypic correlations), path analysis, genetic distance, factor analysis, etc. This information would be valuable for the genetic improvement of seed yield under both normal and stress growing conditions. Information on the studies conducted in Asia, especially in India, where beans are most extensively cultivated and consumed, is totally lacking. Much more variation in beans occur in the NW. Himalayan regions of India than is depicted in this book.

Despite these omissions, the book is a rich source of information in a compiled form and is valuable to legume breeders in general and bean breeders in particular.

M. L. H. Kaul, Bonn