

Book reviews

Pulsed Field Gel Electrophoresis: A Practical Guide. Bruce Birren and Eric Lai. Academic Press (Harcourt Brace), London. 1993. Pp. 253. Price £27.00, comb-bound. ISBN 0 12 101290 5.

As the only manual dedicated to Pulsed Field Gel Electrophoresis (PFGE) this is certain to be a success. However, uniqueness is only one of its virtues. It is thorough, practical, clearly written, well laid-out, and easy to use.

Being a hands-on, practical book it is rather brief on the theory. Contour clamped Homogeneous Electric Field electrophoresis (CHEF) is one of the most widely used forms of PFGE, but definitions like "Homogeneous field: electric field that has a uniform P.D. across the whole field" are insufficient to give the novice any grasp on what is involved. However what CHEF can and cannot do is clearly described, together with appropriate applications for variations such as OFAGE (Orthogonal Field Alternation Gel Electrophoresis), TAFE (Transverse Alternating Field Electrophoresis), FIGE (Field Inversion Gel Electrophoresis), RGE (Rotating Gel Electrophoresis), PACE (Programmable Autonomously Controlled Electrodes), ZIFE (Zero Integrated Field Electrophoresis) and ST/RIDE (Simultaneous Tangential/Rectangular Inversion Decussate Electrophoresis). This is certainly the research field of choice for those fond of acronyms! Suppliers of equipment are tabulated, together with specifications and prices, and best buys are named for particular purposes. The book even includes diagrams which give sufficient detail for the construction of a CHEF gel box, together with the electrode array and associated electrical circuitry.

Over a quarter of the text is devoted to the different methods for preparing large intact DNA fragments, in agarose plugs, which are suitable for PFGE. Detailed descriptions are given for the preparation of DNA size markers, from phage and plasmid concatamers and from yeast, followed by more concise descriptions of the preparation of DNA from mammals, bacteria, *Mycoplasma*, Protozoa, *Caenorhabditis*, *Drosophila*, *Dicytostelium* and plants. Extensive consideration is given to the particular problems of both partial and complete digestion of DNA in the inhibitory environment of agarose plugs. A useful feature is the table of restriction enzymes showing the concentrations (units of enzyme) and digestion times required for the complete digestion of a given amount of DNA.

Those already using PFGE will probably turn straight to the chapters on switch intervals and the variables which affect resolution. Numerous photographs of yeast chromosomes run with different switch intervals show the effects on the maximum size of DNA which can be resolved and on the separation achieved in different parts of the gel. Mobility plots are also used to show the relative separation of differ-

ent sized DNA fragments over a range of switch intervals. These practical guidelines, together with the discussions of voltage, agarose, temperature, running buffers and reorientation angles, enable the user to change conditions systematically in order to achieve a desired result. However, more detailed coverage of run times would have been helpful, particularly for those experimenting with new conditions. A valuable part of the book is the trouble shooting guide provided in the final chapter and this is a feature that other authors could usefully copy. Most of the commonly encountered problems are covered and discussion of the possible causes of smearing ranges from poor sample preparation to an illustration of the effects of earthquakes!

A further useful feature is the impressive bibliography, which includes 900 references although this is made more manageable by cross referencing to both organism and technique. It is hard for reviewers not to concentrate on their own field of interest, but the cross-referenced bibliography on *Leishmania* (*sic*) is, at least, comprehensive despite the mis-spelling! Those researchers who do not have on-line access to one of the standard bibliographic databases will find this book a useful source of reference.

In summary, this book is to be commended and should certainly be on the purchase list for anyone contemplating PFGE for the first time. However, it will also prove valuable to those already using the technique, who want a ready source of reference as well as easy access to new information.

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Breeding Oilseed Brassicas. K. S. Labana, S. S. Banga and S. K. Banga (eds). Springer-Verlag, Berlin. 1993. Pp. 251. Price £70, hardback. ISBN 3 540 55854 3.

The significance of oilseed brassicas in global agriculture and international trade has increased tremendously over the last three decades. This increase has been brought about by both economic factors and agricultural policies and advances in breeding, particularly the development of low erucic acid and low glucosinolate cultivars. Alongside their greater agricultural importance, there has been an increase in the use of *Brassica* in more basic research, in part because of their amenability in genetic studies, tissue culture and transformation. As a consequence of these two trends, our knowledge of *Brassica* is increasing rapidly and there are excellent opportunities both for the application of many of the new biotechnologies to oilseed *Brassica* improvement and also to

provide genetic explanations for empirical advances in breeding. With this background, the editors of *Breeding Oilseed Brassicas* have attempted to "bring together critical and comprehensive reviews on research approaches, achievements and limitations to breeding better brassicas". This is an admirable but daunting task considering the many different environments in which oilseed brassicas are cultivated, and the need to consider at least three species, *B. campestris*, *B. juncea* and *B. napus*, each of which is of global importance. I am not sure that they have succeeded very well.

The book does not provide comprehensive reviews. For example, there is an entire chapter devoted to isozymes and their potential use (or lack of use) as molecular markers, but no consideration at all is given to other types of molecular markers, particularly restriction fragment length polymorphisms, which are likely to be of considerably greater use than isozymes, and are currently being used within several breeding programmes. Similarly, the chapters on disease and insect resistance are very much orientated towards those pathogens and pests which are important in India, with little consideration of those important in other areas. While I realize that it can be argued that many books on plant breeding are written from a western perspective, it is rather bizarre that in a book which purports to provide a comprehensive account, little information is given on any insect pest other than the Indian mustard aphid. This is particularly so when considering the importance of, for example, flea beetles in Canadian Canola production. The same problem arises in the chapter on diseases, which is largely concerned with the two most important diseases in India, namely *Alternaria* blight and white rust, with relatively little on diseases such as *Sclerotinia* and (particularly), blackleg, which are of import-

ance in Europe, Australia and Canada. The chapter on transformation is well written and appropriate but I would have liked to have found some more examples of the potential economic exploitation of genetic modification, such as the development of cultivars with novel fatty acids for industrial uses or the introduction of pest resistance genes.

In addition, the standard and content of the different chapters is variable. The chapter on embryo rescue appears to have provided the author an opportunity to publish some of his own results rather than provide a review of the different methods and technical approaches available. The chapters on pest and disease resistance however, are akin to a practical handbook rather than a review of the pertinent features of the different pest/pathogen interactions. In contrast, several of the other chapters are well written and provide good overviews of the subject areas and excellent literature reviews.

To conclude, I think that the book is good in parts. However, I do not think that it provides comprehensive reviews, nor do I think that it has a strong practical bias, as the editors claim in the preface. Despite my reservations, I think that many students, plant breeders and research scientists who want some background information on breeding oilseed brassicas will find it useful. However, I expect it will soon be superseded by other books of a more comprehensive nature. Lastly, like many potentially useful books, it is grossly overpriced.

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Books received

Gene Regulation in Eukaryotes. Edgar Wingender. VCH, Weinheim. 1993. Pp. 430. Price £67.00, hardback. ISBN 3 527 28460 5.

Introduction to Molecular Cloning Techniques. G. Lucotte and F. Baneyx. VCH, Weinheim. 1993. Pp. 298. Price £32.50, hardback. ISBN 3 527 89613 9.

The Molecular Biology of Flowering. Brian R. Jordan (ed.). CAB International, Oxford. 1993. Pp. 272. Price £45.00, hardback. ISBN 0 85198 793 1.

Molecular Markers, Natural History and Evolution. John C. Avise. Chapman and Hall, London. 1993. Pp. 511. Price £75.00, hardback. ISBN 0 412 03771 8.

Nucleic Acids and Molecular Biology (7). Fritz Eckstein and David Lilley (eds). Springer-Verlag, Berlin. 1993. Pp. 341. Price £99.00, hardback. ISBN 3 540 56218 4.

Handbook of New Bacterial Systematics. M. Goodfellow and A. G. O'Donnell (eds). Academic Press (Harcourt Brace), London. 1993. Pp. 560. Price £80.00, hardback. ISBN 0 12 289672 6.

Methods in Molecular Genetics: Gene and Chromosome Analysis (Part A). Kenneth W. Adolph (ed.). Academic Press (Harcourt Brace), London. 1993. Pp. 404. Price £34.00, hardback, ISBN 0 12 044301 5.

Twins as a Tool of Behavioural Genetics: Dahlem Workshop Reports (Life Sciences Research Report 53). T. J. Bouchard Jr. and P. Propping (eds). John Wiley, Chichester. 1993. Pp. 310. Price £60.00, hardback, ISBN 0 471 94174 3.