final short section, 'Alternative amplification strategies', details two examples of the use of the Ligase Chain Reaction to detect single base pair changes in known sequences.

As the whole aims at diversity of subject coverage plus detailed protocols, many chapters come across quite dry and sparsely written. This is however, a manual not a 'good read', so this can be forgiven in view of the wealth of protocol detail and diagrams/photographs provided. Having said this, almost all chapters are well written, and the editors (and authors) have managed to avoid extensive repetition of basic theory and techniques. Whilst the editors would not claim this volume provides an exhaustive list of the current state of the art of PCR (and it is an art, isn't it?), it provides more than enough novel directions and details to make it a necessary addition to any DNA laboratory's library (if you have *PCR Protocols*, that is).

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Cell Cycle Control (Frontiers in Molecular Biology, 10). C. Hutchinson and D.M Glover (eds). IRL Press (Oxford University Press), Oxford. 1995. Pp.304. Price £29.50, paperback. ISBN 0 19 963410 6.

How does the average cell spend its day? The simple answer is that it depends! A human somatic cell, for example, will grow, enter mitosis and divide but the cellular processes associated with these dramatic events only occur in concert with careful monitoring and integration of a plethora of intra and extracellular signals. The truth is that there is no such thing as an average cell and the study of the progression and co-ordination of these events, the cell cycle, in a variety of organisms and cell types has grown into one of the most fascinating areas of modern biology.

Studies of the eukaryotic cell-cycle have their origins in the 1950s; earlier observations of the process of cell division date back to the latter part of the nineteenth century. However, the last decade has seen a veritable explosion in our understanding of its intricate control mechanisms. *Cell Cycle Control* is a compilation of ten chapters, each contributed by different authors active in cell cycle research. The overall aim of this volume is to provide a summary of the most recent advances in this area. Inevitably, the rapidity of research progress coupled with publishing limitations renders this goal unattainable. In spite of these problems, *Cell Cycle Control* comes remarkably close to its objective.

Leland Hartwell opens the batting with a concise introduction to the basic principles which underpin our current understanding of cell cycle control. In particular, the central, unifying role of the cyclin dependent kinases (CDKs) is described which establishes the perspective of the remainder of the book. The following chapter by Reed, Hutchinson and MacNeill continues in this introductory vein with an historical perspective including a lucid and reasonably comprehensive discussion of a variety of genetic and molecular tools used in cell cycle research. Arguably the most powerful genetic systems, those of budding and fission in yeast, are prominent in Chapters 3 and 4, respectively, in the context of studies of START and the G1-S transition and then control of entry into mitosis. S-phase regulation in higher eukaryotes is dealt with by Julian Blow in Chapter 7 following chapters focussed on the structure and activation of cdc2 CDK along with a more general analysis of the ever growing family of CDKs and their regulatory subunits, the cyclins. Zetterberg and Larsson continue on a more macroscopic scale with a description of the use of time-lapse video techniques for kinetic analyses of cell-cycle progression and specifically, events occurring during the G1 phase. This leads nicely into a consideration of disruptions of cell cycle control and the development of cancer by Lees and Harlow. White-Cooper and Glover round off affairs with a discussion of the role of cell cycle control in *Drosophila* development as the best characterised multi-cellular system.

Overall, the layout of the book is excellent. The order of presentation is logical and well conceived with the happy result that there is precious little redundancy in the information provided. It is not, however, a book for the casual reader. The contributions are detailed and well referenced. Illustrations are, by and large, clear and unfussy. For these reasons it will be a valuable reference source in many labs and a good general introductory text to those entering the field of cell cycle research.

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Gel electrophoresis: Nucleic Acids. Robin Martin. Bios Scientific Publishers, Oxford. 1996. Pp.175. Price £17.95, paperback. ISBN 1 872748 28 7.

This is an elementary introduction to the principles, methods and applications of gel electrophoresis of nucleic acids. At one point early in this book the importance of the sequencing gel to the science of this century is noted. The electrophoretic gel is the cornerstone of the practise of modern molecular biology, and it is hard to think of another technique that is so central. Go into any laboratory and you will be confronted by gels of different size, orientation and type. Despite their simplicity, gels have enormous resolving power. They are used to analyse the size and sequence of nucleic acids, for the purification and preparation of DNA and RNA, and the humble gel has

completely replaced the ultracentrifuge for the exploration of the shapes of nucleic acid molecules.

All molecular biology laboratories operate a series of protocols for the preparation and running of electrophoretic gels that newcomers must quickly learn. This book provides a primer for the uninitiated in the use and application of electrophoresis. It begins with some very basic theory on the physical principles and then discusses in general terms the choices to be made between media (agarose, polyacrylamide), conditions (native, denaturing) and mode of operation (vertical, horizontal) as well as methods of detection (staining, autoradiography, blotting etc). It then moves on chapter by chapter to consider the specific uses of native and denaturing agarose gels, native and denaturing polyacrylamide gels and pulse field gels. In these later chapters the methods are illustrated by specific examples — so-called 'research applications'. Along the way a number of methods in common use are introduced, such as DNA sequencing, analysis of DNA-protein interactions by electrophoretic retardation and footprinting, and the detection of polymorphisms.

I think that this book would be most useful to an undergraduate student who is about to embark on an extended project in molecular biology. In general it is written at such a basic level that anyone using the techniques will grow out of it very quickly. Despite this, there are no practical protocols given, and the reader is directed to those found in Sambrook, Frisch & Maniatis (1989) and manufacturers' handbooks.

I feel that there are a number of limitations to the book. Given that the entire technique rests on an analysis of migration through gels, the theory is quite superficial, with very little reference to theories such as the classical analysis of Lumpkin and Zimm, and later approaches. An important aspect of gel electrophoresis of nucleic acids has been the analysis of molecular shape, such as that of bent and branched DNA molecules, which is neglected. The execution of the technique is simple, yet it has proved extraordinarily powerful in such systems, and has always provided a reliable description of global shape when further analysed by other biophysical methods. Gel electrophoresis has been central to the study of the topological properties of circular DNA, and hence in the analysis of site-specific recombination reactions for example.

Quantitation of material in gel bands is critical to many applications, but this is hardly discussed. For example, while gel shift methods are covered in terms of crude cellular extracts, the estimation of association constants using purified proteins is not. Some guidelines on the pitfalls to avoid in this process would be very useful. I found it surprising that in the chapter devoted to detection, the phosphorimager only merited the most cursory mention. Yet this is the source of most quantititative data from gel electrophoresis.

Finally, the great resolving power of gel electrophoresis is commonly exploited as a purification tool; it is generally superior to HPLC methods in this regard. This requires the recovery of DNA and RNA in a form that can be used in further manipulations. There are many ways this is done in different laboratories, to say nothing of the myths that abound. Some review of these methods would be useful, and would certainly fit in with the other techniques presented.

In conclusion I feel that this book will be useful to the real beginner in practical molecular biology, but would have been more widely read if it had been pitched at a somewhat higher level. How many people will be willing to pay £17.95 for a book that they will probably discard after a few months is hard to judge, but they might prefer to spend the money on more general practical guides.

References

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Wheat Rusts – An Atlas of Resistance Genes. R. A. McIntosh, C. R. Wellings and R. F. Park. CSIRO Publications, Melbourne. 1995. Pp. 208. Price £63.00, hardback. ISBN 0 643 05428 6.

Nearly all wheat researchers, breeders and pathologists will know Bob McIntosh, the senior author of *Wheat Rusts – An Atlas of Resistance Genes* for the invaluable service he has provided for over 25 years in producing the annually updated *Catalogue of Gene Symbols for Wheat*. An extremely important part of this comprehensive list of all published genes, DNA and protein markers in wheat is the section dealing with pathogens. The new *Atlas* brings together a wealth of information accumulated by Bob McIntosh, his past colleagues and present co-authors, Colin Wellings and Robert Park, on the rust diseases of wheat.

The main aim of the book is to provide comprehensive information of all know genes for resistance to stem rust (*Puccinia graminis*), leaf rust (*Puccinia recondita*) and stripe rust (*Puccinia striiformis*) in wheat and triticale, with the aim of helping breeders in their continuous battle to reduce the potentially devastating yield losses that can be caused by rust epidemics. For more than one hundred recognized rust resistance genes comprehensive details are given for chromosome location, infection type, environmental variability, origin, pathogenic variability, varietal reference and source stocks and potential agricultural uses of the gene. All genes are illustrated with colour plates of infection types to help with gene identification. In addition to the main catalogue of resistance genes the book also contains a well presented introduc-