

Book reviews

The Eukaryotic Genome: organisation and regulation (Society for General Microbiology, Symposium 50). P. M. A. Broda, S. G. Oliver and P. F. G. Sims (eds). Cambridge University Press, Cambridge. 1993. Pp. 395. Price £60.00, hardback. ISBN 0 521 44364 4.

Studies on eukaryotic microbes have been important to our understanding both of the organization of eukaryotic genomes and of the molecular mechanisms which regulate their expression. The project to sequence the yeast genome has foreshadowed sequencing projects on other eukaryotic genomes and with the availability of the complete sequence of yeast chromosome III has come new insights into eukaryotic genome organization. Our understanding of the key cellular processes that regulate eukaryotic gene expression would be severely limited without the contribution of work on eukaryotic microbes, particularly yeast. The stated aim of this volume is to review progress in understanding the organization and regulation of eukaryotic genomes, from the perspective of complex microbial models, and to point the way forward in the field. This is an ambitious objective for a single volume and partially explains why I was left with the feeling that this book is a case of the whole being less than the sum of the parts. Being a multi-authored volume of symposium proceedings it might be expected to contain a diversity of styles and approaches. Unfortunately, the large range of topics covered, and the differences in the types of reviews, contribute to a rather unfocused feel.

The volume starts well with a chapter by Oliver *et al.* on the sequencing of yeast chromosome III. This is a concise and well-written account describing a project of which the yeast community can feel justifiably proud. The volume also ends well with the final chapter by Cavalier-Smith on the evolution of the eukaryotic genome. Although this was a more comprehensive review, the use of sub-headings made it very easy to dip in and out of the chapter as required. There are 12 further chapters covering DNA replication, telomeres, chromatin structure, mitochondrial genomes, gene organization in filamentous fungi, gene organization in trypanosomatids, homologous recombination, mating type genes, gene regulation in *Candida*, gene expression in filamentous fungi, yeast gene expression and regulation of mitochondrial biosynthesis in yeast. This seems a rather arbitrary selection of topics that gives a view of the field but not a clear picture. Furthermore, the chapters do not appear to be arranged in any logical order. I felt that the chapters by Turner, on gene organization in filamentous fungi, and by Caddick and Turner, on the control of gene expression in filamentous fungi, should have been consecutive, instead of being separated by four chapters. Out of the 12 further chapters the highlight for me was the contribution by Greider on telo-

meres. Although it contains much in common with a number of other recent reviews it was well written and included both an overview and some experimental data. It also ended with some discussion on the implications of results from microbial eukaryotes for the understanding of mammalian systems. Although this was one of the aims of the volume several of the reviews failed to attempt this.

I also enjoyed the chapters on yeast gene expression by Mellor and global regulation of mitochondrial biogenesis in yeast by Grivell *et al.*, probably because these were closest to my own interests. If anything the chapter by Mellor was a little too comprehensive. With the aid of clear diagrams it very successfully summarizes the complex range of transcription factor interactions unravelled from detailed studies of a number of model yeast promoters. The chapter by Grivell *et al.* is much shorter but raises some particularly important questions concerning the co-ordination of yeast genes encoding mitochondrial proteins. I am less familiar with the topics of the remaining chapters but all seemed to be competently written. The chapter by Williamson on microbial mitochondrial genomes was a particularly successful treatment of a difficult topic. I also found the chapter by Fangman *et al.* very worthwhile for the clear descriptions of the techniques developed to study the positions of DNA replication origins.

I read this volume sequentially and I failed to get a clear overall picture of the field. However, I probably approached it in a different way to the majority of readers. I imagine that most people will select particular chapters for reading in isolation. When viewed from this perspective it is much better; many of the individual chapters are very good and almost everyone will find something of interest within it. As such it should be regarded as a valuable addition to any library collection.

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Plant Breeding: principles and prospects. M. D. Hayward, N. O. Bosermark and I. Romagosa (eds). Chapman and Hall, London. 1993. Pp. 550. Price £65.00, hardback. ISBN 0 412 43390 7.

The first modern textbooks on plant breeding were R. W. Allard's *Principles of Plant Breeding* (1960) and F. N. Briggs and P. F. Knowles' *Introduction to Plant Breeding* (1967).