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Book reviews

The Chromosome. J. S. Heslop-Harrison and R. B. Flavell. Bios Scientific Publishers. Oxford. 1993. Pp. 281. Price £49.50, hardback. ISBN 1 872748 32 5.

What would you expect of a book entitled *The Chromosome*? At the very least I suppose, two telomeres, a centromere and an origin of replication. I came to this volume with the expectation that I would come away better informed on these topics and on other aspects of chromosome biology. I was disappointed. The telomeres were there, so too was the origin of replication. Also present were articles on domain structure, CpG islands, nuclear organization, and recombination. The centromere was missing though there was a piece on DNA segregation in bacterial cell division. What was disappointing was that I knew too much already about some of the topics for them to be interesting and I knew too little about other topics to be able to understand them as presented here.

The Chromosome is the book of a meeting, and as such it suffers from the faults which are common to almost all such books. First, it is not at all clear at whom these volumes are aimed. It is the conference participants? Surely not. How many of us are likely to go now to our university bookshop to buy the report of a conference which we attended in September 1992? Not many I think. If we attended the meeting I would like to hope that we received abstracts, took copious notes and spent long and profitable hours in the bar in conversation with the authors (or even with the people who did the experiments). Furthermore, we probably are actively interested in the subject and have kept abreast of the current literature (and if a week is a long time in politics, how much longer does it seem today in molecular genetics). If not the conference participants themselves, maybe their colleagues also working in the field but unlucky enough not to attend the meeting might like to buy this book. But this also seems unlikely, since they too will have kept abreast of the literature. What about workers in related fields? I think that I myself come into this category; I have for a long time been trying to assemble a cosmid contig map of the human Y chromosome which must mean that I am interested in the structure of chromosomes. I suppose that I am, but really only in their content of genes and in the gene organisation and evolution. I rarely think in units as large as a chromosome; a megabase of DNA seems like a very big chunk to me. Is this a suitable volume for my selves? (I must have thought that it might be when I agreed to this reveiw). I am sorry to say that it is not particularly useful. I found several areas in the book. There were papers concerned with genome projects such as that in Blattner *et al.* on the progress in the *E. coli* genome project and the equivalent papers on *S. cerevisiae* and *Arabidopsis* and other plant genomes by Oliver *et al.* and Flavell *et al.* These were areas with which I was reasonably familiar, having heard similar (and more recent) papers presented at the annual Cold Spring Harbor Genome Mapping and Sequencing meetings. I found these easy to understand, but I learnt little that was new. Then there were some straightforward pieces on telomeres and on CpG islands which again seemed familiar. I knew less about the β-globin expression domain and found the article by Dillon *et al.* a good introduction. I teach third-year genetics students about imprinting and hoped that I might find the piece of Ferguson-Smith and Surani useful but was disappointed. It might have been useful in 1992 but in 1994 it has passed its sell-by-date. Recent reviews in *Current topics in Genetics and Development* and similar journals have overtaken this paper. I wonder if the same is true of the paper by Henikoff *et al.* on position effect variegation in *Drosophila*? I found this a fascinating story and if I can find time will have to check up on the latest state-of-the-art. There were a number of papers on the arrangement of chromosomes in the nucleus which could have been interesting but which somehow failed to get my full attention; I seemed to spend too much time wondering whether the experiments reported were susceptible to alternative explanations or whether those who were expert in the field would immediately rule these out. For instance, I don't know whether the within-nucleus genome separation shown in interspecies hybrids (Fig. 2, of Heslop-Harrison *et al.*) might not just be a trivial consequence of the greater binding affinities within a species rather than between species of co-evolved sets of DNA binding proteins. Similarly, the papers on bacterial chromosomes assumed that I possessed far more background knowledge than is the case.

So who, then, might want to read this book? Perhaps a graduate student just entering any of the areas covered might find it a useful introduction to the state-of-the-art eighteen months ago and as such it has potential value. However, my advice is not to rush to buy a copy for your library. For general introductions to this and to many other fields you are far better served by subscriptions to review journals which publish on a tighter schedule.

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The Molecular Biology of Flowering. Brian Jordan (ed.). CAB International, Oxford. 1993. Pp. 272. Price £45.00, hardback. ISBN 0 85198 723 0.

Fans of David Lodge will recall that in the novel *Changing Places*, Philip Swallow, on sabbatical from the semi-fictional

University of Rummidge, encounters a course called 'The Death of the Book? Communication and Crisis in Contemporary Culture'. If you are wondering why I was reminded of this, it was because *The Molecular Biology of Flowering* arrived on my desk at about the same time as a special issue of the journal *Plant Cell*, entitled '*Plant Reproduction*'. The two cover many of the same areas, so how do they compare?

The book has nine chapters by 14 authors, covering a range of topics including the physiology of flower induction, signal transduction (largely drawn from animal work), vernalization and photoperiod genes, changes in gene expression during flowering, floral homeotic genes, anther development, fertilization and self-incompatibility, and the control of flower colour. Potential plant breeding applications are also briefly discussed. The book aims to describe the current knowledge of the molecular basis of flowering for research workers and advanced students. Current in this context means 1992 since I found only one 1993 reference, and that was described as 'in press'.

Readers fearing (or hoping for) a solid tome of hardcore molecular biology will be relieved (or disappointed) to find that the book has a sensibly broader outlook. There are two good reasons for this. First, as the book says, the molecular biology needs to be understood in the context of both historical and contempory whole plant work. Secondly, as the book also says, knowledge of the molecular biology of some areas (such as floral induction) is scant, and would not make much of a chapter. Other sections, such as those on screening cDNA libraries for genes expressed at particular stages of flowering, concentrate on methodologies and although flower specific genes are described there is only preliminary information on their possible roles. Interestingly, comparison of the various chapters leaves you feeling that it is no coincidence that the most advanced areas in terms of molecular analysis (floral homeotic genes, self-incompatibility and flower colouration) are those built on a firm foundation of genetic analysis and the availability of mutants.

As a result of the considerable variation in what is known about the molecular basis of various aspects of flowering, the book inevitably contains some speculative sections. Given that the reader is proceeding with the normal degree of healthy scepticism this is no bad thing, since these parts are thought-provoking, and they serve to illustrate current opinions on likely mechanisms. Overall, it is a useful book, but it would have benefitted greatly from more illustrations. To give just two examples; there are no pictures showing the changes that occur in mutant flowers, or the structure of embryo sacs.

How does the book compare to the special issue of *Plant Cell*? The latter offers 50% more pages, extra topics, more Big Names, better illustration and reviews that are more up-to-date. And it's cheaper. Of course, the two do not overlap completely and ideally one would read both. For example, genes controlling vernalization or photoperiod response are only covered in the book. But if I had to pick one for the molecular biology it would be the *Plant Cell*. This is not because of any particular defect in the book under review. Rather, it is a reflection of how difficult it is becoming for books, with their longer publication times and higher costs, to compete with journals in reviewing specific areas of research.

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Nucleic Acids and Molecular Biology (7). Fritz Eckstein and David Lilley (eds). Springer-Verlag, Berlin. 1993. Pp. 341. Price £99, hardback. ISBN 3 540 56218 4.

This book is part of an annual series that discusses a variety of topics in nucleic acid structure, function and interactions with proteins. Each chapter is a short but detailed review of a specific area of key workers; mainly of their own work. After an initial chapter on the *cis–Pt* complexes of DNA, this volume covers various DNA–protein complexes from both prokaryotes and eukaryotes and then RNA structure and RNA–protein interactions. The DNA–protein complexes discussed include examples of α-helical proteins, 434 repressor, LexA, and FIS; a β-sheet protein, the Met repressor; leucine zippers Fos and Jun, and zinc-binding motifs from TFIIIA and steroid hormone receptors. In addition there are chapters on *Eco*RV, recombination, resolvases and nucleosome positioning. One of the themes that emerges from these chapters is the important role of DNA structure and bending in complex formation. The last third of the book deals with a variety of topics involving RNA. The role of the nucleoskeleton in RNA metabolism, gene regulation by the retinoblastoma gene, and the selection of RNA and DNA sequences *in vitro* are discussed. The structure of RNA pseudoknots is analysed and this is followed by chapters on RNA–protein interactions and tRNA–ribosome interactions.

As can be seen, the topics discussed cover a wide area. For some proteins such as RNAse HI and the DNA binding domain of the glucocorticoid receptor, the X-ray crystal structures are discussed in detail. At the other extreme, for the retinoblastoma gene product and the retinoid receptors only the broad outline of their modes of action and the components with which they interact can be discussed. The chapters also vary in length and in experimental detail; in many cases the results of key experiments are discussed in sufficient detail to evaluate them while in others only the conclusions of the experimental findings are mentioned. Despite the number of authors and styles, the chapters are clear and well written. The reviews were up-to-date when written; many references are to 1992 papers, a few even to 1993. Clearly, progress has been made since then in some of the areas covered and most of the work in the reviews has been published in journals.

For me, the merit of the book was not in reading about systems with which I was already familiar, as the work is covered elsewhere. These reviews are, of course, of use to new students or postgraduate workers in the specific area, as they gather together several years work, but they are not comprehensive. Instead, it was the systems with which I was