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Book reviews

Development: the molecular genetic approach. V. E. A. Russo, S. Brody, D. Cove and S. Ottolenghi. Springer-Verlag Berlin. 1992. Pp. 605. Price £45.75, hardback. ISBN 3 540 54730 4.

Developmental biology is currently one of the fastest moving areas of biology and one to which the techniques afforded by molecular biology have contributed much. As such, there is a need for both teachers and researchers in the field to be supplied with good, up-to-date, text books on which to base and extend their knowledge. This multi-author book has attempted to provide a textbook which introduces the reader to the development of a wide range of organisms covering key concepts and approaches. The book covers the development of both prokaryote and eukaryote microbial systems, as well as plant and animal systems, in 35 chapters.

This type of book succeeds or fails on the quality of the individual chapters and the editorial control of the way that they are made to fit together. The editors have made considerable efforts to standardize the format of each chapter. Each is prefaced by a short introduction which describes the basic biology of the organism under discussion, putting it into context, and finishes with an outlook and summary. I found these sections particularly useful in the microbiological section of the book, where I was less familiar with the developmental systems. However, the main bodies of the chapters were rather variable. In some chapters, for example Chapter 1, complex figures were incompletely explained in figure legends, whereas in others these were complete and very helpful. The figures themselves were also of variable quality; those in Chapter 24 were obviously and rather poorly hand-drawn while many others were well drawn and reproduced. There is really no excuse for this variability.

In the main, the order of the chapters and the areas that they cover follow a logical sequence. In the section covering microbial systems there are chapters on virus assembly and morphogenesis, development in *Caulobacter crescentus*, *Streptomyces coelicolor*, *Bacillus subtilis*, Fission yeast, *Neurospora crassa*, *Aspergillus*, Trypanosomes and *Dictyostelium*, I particularly enjoyed the section on trypanosome development. The plant section includes developmental regulation in the moss, *Physcomitrella patens*, plant photoreception, the exploration and exploitation of *Agrobacterium tumefaciens*, *Arabidopsis*, and homeotic genes in *Antirrhinum majus* and *Rhizobium*-legume symbiosis. *Arabidopsis* came over as the organism of choice. In the animal development section, the chapters on *Caenorhabditis* and *Drosophila* are concise and informative reviews of early pattern formation. I found the chapter on *Xenopus* embryogenesis, the area of my own research interests, rather disappointing. It lacked many of the recent and considerable advances that have been made on early cell signalling events in embryogenesis, both in the identification of new genes and in the disruption of known genes by reverse genetic approaches. The developmental regulatin of 5S ribosomal genes in *Xenopus* was also included. Five chapters were included on mammalian development and associated technology: first, a useful chapter on the identification in the mouse of developmental control genes by homology with *Drosophila* genes, then chapters on the t-complex, *in situ* hybridization on mouse embyros, insertional mutagenesis and a good chapter on the introduction of DNA into mouse embryos, including ES technology. Chapters 29 and 30 seemed to be in the wrong order, since Chapter 30 introduced the technology of how to produce transgenic mice when they had already been used in the preceding chapter. The final few chapters looked at defined systems like skeletal muscle differentiation, erythroid development and myeloid and hepatocyte differentiation. These were useful, but the reason for the inclusion of these and the exclusion of other systems, for example limb development, was not apparent. Finally a single chapter was included on growth control in animal cells.

The question that I had in my mind as I read through this book was 'Is this the sort of book that I would recommend my undergraduates, currently doing a course on developmental biology, or my graduate students to read or buy? These are the groups of individuals at whom the book is aimed, as stated in the preface. The answer to this question is, sadly, 'no' to both counts for several reasons. First, this book is far too expensive for either a graduate or an undergraduate student to buy given the current levels of grants and Publishers must take into account this major consideration. Secondly, and more damning, is the fact that even if this book cost one third of the published price (incidently the cost of the recommended text for the development course at Warwick), I would still not recommend it. Although this book covers many of the areas that would be covered in a molecular biology of development course, for example *Caenorhabditis*, *Drosophila*, *Xenopus* and the mouse, there is no mention of the sea urchin and furthermore none of these areas are covered in sufficient depth to be able to stand by themselves as the authoritative text. Third, and finally, the multi-author format does not lend itself to books for teaching and perhaps should be reserved for symposium volumes where themes and logic flow are not so important. In the last year or two some very excellent texts on development have been produced covering *Drosophila* (*The Making of a Fly*, P. A. Lawrence, Blackwell Scientific Publications); some of the selected animal developmental systems mentioned above (*From Egg to Embryo*, second edition, J. M. W. Slack, Cambridge University Press), and a general animal development textbook (*Developmental Biology*, third edition, L. W.

Browder, C. A. Erickson and W. R. Jeffery, Saunders College Publishing). All of these I highly recommend to undergraduates or graduates. Although these books do not feature microbial systems, most development courses do not either!

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Regulation of the Eukaryotic Cell Cycle. (Ciba Foundation Symposium 170). T. Hunter (chairman). John Wiley, 1992. Pp. 289. Price £42.50, hardback. ISBN 0 471 93446 1.

The focus of cell cycle research has changed almost beyond recognition in the past five years. The discovery that the cdc2 protein, controlling entry into both S-phase and mitosis in fission yeast, has functional homologues in higher eukaryotes and is a component of the biochemically defined M-phase promoting kinase (MPF) has opened up a powerful mixture of biochemistry and genetics for cell cycle research. cdc2 and the cyclins that activate it for different cell cycle functions are now centre stage. This book is an up-to-date review of this new-look cell cycle research.

The book manages to provide a unique combination of authority and timeliness. It contains contributions from many of the labs that are foremost in this area of research. Furthermore, most of the results presented in detail are from very recent papers, addressing current issues and dilemmas. This is particularly praiseworthy given the hectic pace of research in this field, and the usual problem of books being out of date before they are even published.

Another feature of the book which I found very useful, much to my surprise, was that each paper was followed by an extensively documented 'discussion'. I was expecting these discussions to be desultory and uninspired. Instead they contained in-depth analyses of some of the most important problems raised by the papers, often backed up with currently unpublished results. Reading them, I felt that I was a witness to discussions dealing with issues whose solutions will be gracing the pages of *Nature* and *Cell* in the next few years. The amateur psychologist is also provided with interesting material with which to analyse the personality of some prominent researchers in this field; by the end of the book, some of these faceless characters will definitely have come alive for you!

My reservations about the book stem principally from its good points. You can't write for both insiders and outsiders, and I suspect that many interested readers from even closely related fields will soon be baffled by arcane details of phosphorylation sites and the growing families of cdc2 and cyclin proteins. The events of the cell cycle themselves are barely addressed in the book: mitosis and DNA replication are essentially viewed as activities to be controlled, and as such subservient to the cdc2/cyclin paradigm. However, for people interested in learning about this field, it is the most comprehensive volume covering contemporary developments that I am aware of. In summary, the book will be indispensable for people working in the field, whilst outsiders will find little information about the actual events of the cell cycle but plenty about the universal mechanisms that control them.

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