

## Book reviews

**Genetic Analysis of Animal Development (second edition).** Adam S. Wilkins. Wiley-Liss, New York. 1993. Pp. 546. Price £37, paperback. ISBN 0 471 50270 7.

For the developmental geneticist, this book is a useful addition, providing a wealth of information on the developmental genetics of the three most commonly studied organisms, *Drosophila*, *Caenorhabditis* and *Mus*. The book is divided into six core chapters which look individually at early and late development of the three chosen organisms. These core chapters are preceded by two chapters with chapter 1 focusing on the historical perspective of developmental genetics. I found this both interesting and well written, going over old ground without making the reader aware of this. Chapter 2 is an addition to this edition, and introduces some of the fundamental issues that face developmental geneticists. It includes descriptions of maternal effect genes (and the use of mutations in these genes to understand early development) definitions of terms commonly used to describe the differentiated state and a description of the classical solutions to pattern formation. It also explains how an understanding of developmental genetics can now be seen to explicitly explain classical embryology. This chapter seemed to integrate well within the volume.

The subsequent six chapters form the mainstay of the volume. From my own personal point of view, I would have preferred to have the pair of chapters on each organism grouped together for ease of reading, though I can understand the logic of dealing with the early development of all the organisms before the later development, to enable comparisons to be made where applicable. Each of Chapters 3 to 5 starts with an introduction to the organism as a developmental system, and a summary of the life cycle and oogenesis. These sections are useful to the non-expert who is perhaps reading about one of their less 'favourite' organisms. They then go on to describe in detail the genetic systems studied within each organism. As a text of the genetics of development, it treats the non geneticist gently, with good explanatory diagrams and clear explanations of the interpretations of the experiments. This makes instructive reading to those of us less familiar with dealing with genetic studies. Chapter 4 focuses on *Drosophila* and is necessarily meaty, describing the maternal systems which define the anterior, posterior, dorso-ventral and terminal axes of the developing embryo. Again this chapter provides clear summary tables and explanatory diagrams. Chapter 5 covers early mouse development including studies on chimaeric embryos and genomic imprinting.

Chapters 6 to 9 cover the later stages of development of each organism and their control by zygotic genes. Each chapter is again prefaced by an introduction which forms an overview of embryogenesis and post-embryonic development. Chapter 6 describes in detail the genetic control of vulval development and non-gonadal processes, in particular those controlled by the homeotic genes, in *Caenorhabditis*. It also has sections on gonad and germline development and sex determination. Chapter 7 covers the three main groups of genes controlling segmentation, the gap genes, pair-rule genes and segment polarity genes. Again there are clear diagrams of expression domains and diagrams, where appropriate, of mechanisms of action. Again, for purely selfish reasons, I would have liked to see a diagram summarizing the mode of action and interaction of segment polarity genes. Finally there were sections on the homeotic gene clusters, neurogenesis, imaginal disc development, eye development, sex determination and germline development. I found this a particularly useful chapter, which together with Chapter 4 will help me with undergraduate teaching. Chapter 8 concludes the core sections of the book by analysing the genetics of post-implantation in the mouse, including major sections on homeobox genes and sex determination.

I think it would have been interesting if the book had included a chapter which clarified the links between those organisms which have analysable genetics and those that do not. This would perhaps allow a more general comparison of genetic mechanisms conserved throughout developing systems. Though it is undoubtedly true that many of the most important developmental breakthroughs have arisen from the analysis of developmental mutants outlined in this book, it is also true that insight into developmental mechanisms can be gained from organisms which are not amenable to genetic analysis. Thus the two should progress hand-in-hand.

As a textbook for post-graduates to use as a source of reference, this book is an asset. I fear that it is too advanced for more than the exceptional undergraduate or those involved with a particular practical project which requires more detailed information.

The book ends positively for those involved in developmental biology research, placing the subject very much 'centre-stage'. A place where I hope it will remain for some considerable time.

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