Book Review

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Genomic Imprinting. Edited by Wolf Reik and Azim Surani. Oxford: Oxford University Press, 1997. Pp. 245. $125.00 (cloth); $55.00 (paper).

This book, published 8 years after a book with the same title (Monk and Surnai 1990), shows just how rapidly a field can advance in a very short time. The new work, unlike its predecessor, focuses entirely on imprinting in mammals. Eight years ago, when there were early indications of nonequivalent paternal and maternal genomes and DNA methylation was suspected to be involved, imprinting was a recognizable and intriguing phenomenon; however, no endogenous imprinted genes were known, and the understanding of the molecular basis of differential gene expression was fairly rudimentary. Now, $\geqslant$18 endogenous genes that undergo imprinting have been identified, and current estimates predict the existence of 100–1,000 imprinted genes. The roles of some of these genes, in human disease, and the molecular mechanisms of imprinting are fascinating. Few research areas combine interesting biology with insights into complex regulatory mechanisms such as enhancer sharing, replication timing, chromatin structure, DNA methylation, etc. This new book, edited by two individuals with a real passion for their field, summarizes both succinctly and comprehensively what we know of imprinting.

The individual chapters are written by investigators who are well known in their fields; in many cases, these individuals performed the primary work. The role of DNA methylation in mammalian development is discussed first, underscoring the critical role of the DNA methyltransferase knockout mouse in our understanding of imprinting mechanisms. This is followed by a detailed exposition of experiments utilizing transgenes showing methylation imprints. The next three chapters focus on the molecular mechanisms responsible for imprinting of the well-studied *IGF2R*, *H19*, and *IGF2* genes, from which we have obtained our best information about the molecules that control mammalian imprinting.

The book then switches to discussions of the consequences of genomic imprinting, for fetal development, and Bruce Cattanach and Colin Beechey propose that mice with uniparental disomies, which have played an important role in the identification of imprinted regions, may have shown us all there is to know about potential imprinted regions in the mouse genome. Imprinting diseases, including cancer and Prader-Willi/Angelman syndrome, are discussed in detail, followed by a chapter, by Neil Brockdorff, on convergent themes on X chromosome inactivation and autosomal imprinting. In the final chapter, Laurence Hurst discusses evolutionary theories of genomic imprinting. He outlines, in a very reasoned way, the strengths and weaknesses of various hypotheses that have been suggested as explanations of imprinting.

Genomic Imprinting is written in a clear and logical fashion and brings the reader up to date on the rapid progress that has been made in this field. The diagrams and illustrations are first-rate and show quite clearly why this field has stimulated such an enormous interest. I liked the book's focus on mammalian imprinting, since this allowed a more detailed discussion of the key issues relevant to this field. I also appreciated the preface of the book, which accurately assesses the state of the field and points out the major questions related to each of the chapters. This preface clearly states that, while we have come a long way in the last 8 years, there is still a long way to go. This book is essential reading for anyone who wishes to join this exciting field and for anyone who has followed from the sidelines and wants to be brought up to date quickly.

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Reference

Monk M, Surani A (eds) (1990) Genomic imprinting (Development 1990 Suppl). Company of Biologists, Cambridge

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