

Book Reviews

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Telomeres, 2nd Edition. Edited by T. de Lange, V. Lundblad and E. Blackburn. Cold Spring Harbor Laboratory Press. 2006. 576 Pages. ISBN 0-87969-734-2. Price \$135. (hardback)

There has been an explosion of information since the first edition of ‘Telomeres’ was published in 1995 and it is now, in my view, close to impossible to keep up with the literature in all aspects of telomere biology and sometimes even with key research papers. It is therefore timely that a second edition of *Telomeres* has been published this year. In the intervening decade, major advances in our understanding of the structure and function of telomeres and telomerase have been made in some truly enlightening publications and conferences. These advances include comprehensive analyses of telomerase expression and regulation; the discovery of t-loops and the proteins involved in capping chromosomes; a greater understanding the complexity of telomere dynamics in the suppression and progression of cancers; and a full recognition of the ALT pathway for telomere length maintenance. There is also an increasing awareness of the role that telomere length contributes to human genetic diseases.

This second edition of *Telomeres* was edited by three scientists, Titia de Lange, Vicki Lundblad and Elizabeth Blackburn who are all at the forefront of the field and they have selected leading figures to write specific chapters. The first chapter, written by Blackburn, summarises the history of telomere biology and it reminds us what scientists working with X-ray machines and low-resolution microscopes achieved towards the understanding of chromosome and telomere biology. In addition, the appendix contains Elizabeth Blackburn’s personal account of the discovery of telomerase, including some of the original autorads that are great to see. The remainder of the book falls naturally into two parts with ten chapters that consider most aspects of telomere molecular biology including telomerase, telomeres in cancer and disease, telomerase independent maintenance, telomere position effect and a specific chapter on telomeres in meiosis. One topic that is perhaps slightly

overlooked in this section of the book is telomere length as a potential risk factor for certain age related human diseases. The six chapters that form the second section of the book, review current knowledge of telomere molecular biology in the best studied organisms including mammals, plants and of course *Drosophila melanogaster* with its telomeres composed of retrotransposons.

All the chapters in the book are densely packed with information and extensive reference lists. There is some repetition between chapters but as most readers are likely to dip into the book from time to time rather than reading the whole book in one sitting, an element of repetition is likely to be useful. There is also variation in the extent to which individual authors have included speculative models or their own thoughts on which areas await further advancement. When included, the speculation makes the chapters more interesting to read. The quality of the figures varies between chapters with some containing text that is too small to read and other chapters have few or no colour figures. However this does not seriously detract from the book, which is surely a ‘must have’ for all telomere aficionados. The book will also be very valuable to undergraduates seeking advanced knowledge and to graduate students and other newcomers to the telomere field, although those with a medical background may find some chapters difficult to tackle.

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Principles of Gene Manipulation and Genomics, 7th Edition. S. B. Primrose & R. M. Twyman. Blackwell Publishing. 2006. 626 pages. ISBN 1 405 13544 1. Price £29.99. (paperback)

A combination of the two previous titles by the same authors, *Principles of Gene Manipulation* and *Principles of Genome Analysis and Genomics*, this new edition; *Principles of Gene Manipulation and*

Genomics is divided into four parts. It covers the basic technological methods used in this area of scientific research from DNA cloning and gene manipulation in microbes, plants and animals to the applications of recombinant DNA technology and the analysis of genomes. The book is intended for both experts in this field and newcomers to this area of science and is an excellent resource for molecular biology and genetics students.

Part I explains the fundamental procedures employed in genetic engineering and genetic analysis and includes chapters on gene cloning, PCR, DNA sequencing, site-directed mutagenesis of cloned DNA sequence and the construction of genomic and cDNA libraries. In the preface, the authors note that many 'older readers' (and here I must include myself) will find some of the historical material a bit dated and I do question whether it is necessary to include quite so much background. I also think that many 'younger' readers who are working within this area of science will be familiar with much of the material covered in this part of the book, at least a basic level. In addition, there are an increasing number of books which include the same material, such as the recent editions of 'Gene Cloning and Analysis' by T. A. Brown or 'Analysis of Genes and Genomes' by Richard Reece. However, I think that this book by Primrose and Twyman is written at a higher level, contains much more detail and is generally more informative than many other similar titles.

Where Part I discusses cloning in *E. coli*, Part II looks at cloning in bacteria other than *E. coli* as well as fungi such as *S. cerevisiae*. The authors continue with chapters describing the mechanisms used to introduce DNA into plant and animal cells and how these techniques have enabled gene function and regulation to be studied within the whole cell. These mechanisms have also enabled transgenic technology to be developed which facilitates the genetic manipulation of plants and animals and this subject is tackled in the concluding chapters of Part II.

Part III focuses on how we can make use of recombinant DNA technology in the analysis of genomes, the transcriptome and the proteome. The authors provide an excellent introduction into the methods used in comparative genomics, expression profiling, metabolomics and the structural and functional analysis of proteins. These new 'systems biology' approaches enable gene expression to be analysed on a global scale and in Part IV, the authors describe how this information can be applied to identify gene mutations which are the cause of human genetic disease. The medical and agricultural benefits of genetic engineering are considered in the final chapters of the book.

Principles of Gene Manipulation and Genomics is well written and clearly illustrated throughout, as would be expected from these authors who have considerable experience in this subject. The authors provide excellent 'boxes' at regular intervals which contain extra information about various concepts or experimental details that arise within the main text. There are also useful classic references at the end of each chapter for additional reading. I am not entirely convinced that the amalgamation of the two previous titles into one is a good idea as those with an interest in genome analysis and proteomics may not find the genetic engineering component very interesting and *vice versa*. Newcomers may struggle with the sheer volume of information but the basic principles of recombinant DNA technology and its applications are very clearly explained.

There are many well-thumbed older editions of Old and Primrose's 'Principles of Gene Manipulation' in the Darwin Library here at the University of Edinburgh and these books have been appreciated by many undergraduate students over the years. As you would expect, the new edition brings this technology up to date hence I would recommend it.

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