PostScript

BOOK REVIEWS

Genetics of mitochondrial diseases

Editor I Holt. Oxford: Oxford University Press, 2003. ISBN 0-19-516881-X (hardback)

Genetics of Mitochondrial Diseases is the 47th volume in the widely read series *Oxford Monographs on Medical Genetics*. Despite its relatively small size, this book provides a comprehensive review of contemporary understanding of the genetic and biochemical basis of human mitochondrial disease. Unlike other books in the series, this volume focuses on the laboratory science, rather than the clinical genetics. As such it provides an excellent introduction to the field for a scientist or clinician interested in understanding the mechanisms at the cellular, organellar, or genome level. It also provides a useful reference text for workers in the field, who, quite naturally, only have expertise in one or two of the many areas covered in the book. The editor, Ian Holt, has managed to obtain contributions from prominent figures in most of the key laboratories working in the field but, unlike many multi-author books, there is little overlap between the chapters. The finished product is almost seamless, and it provides a balanced view of contentious topics (including the thorny subject of mitochondrial DNA replication, which is dear to the editor's heart at present!).

The book is arranged in five sections. It begins with mitochondrial structure and function, followed by chapters on pathological mutations of mitochondrial DNA and nuclear genes important for mitochondrial disease. The opening chapter on mtDNA replication, repair, and recombination is particularly well written. This is a difficult and complex topic which is discussed with great clarity, and is followed by useful summaries of what is known about mitochondrial DNA expression, biogenesis, and oxidative phosphorylation. The basic science is followed by a section on molecular pathology, and begins with a chapter on clinical aspects of mitochondrial encephalomyopathies. This provides a useful summary for the laboratory scientist, and therefore complements the overall ethos of the book, which is predominantly laboratory based. The chapters on pathological mutations of mitochondrial and nuclear DNA provide a succinct and useful synthesis of the published data, suggest new ways of thinking about old problems, and highlight areas where our understanding is weak. The section on nuclear genes focuses on primary mitochondrial diseases, and includes a discussion of the recently mapped genes that cause multiple secondary mitochondrial DNA deletions and mitochondrial DNA depletion, followed by mutations in nuclear encoded respiratory chain subunit genes and complex assembly genes. Many nuclear genetic disorders have an indirect effect on mitochondrial oxidative phosphorylation. In this book the discussion is limited to diseases where the link with mitochondrial metabolism has been directly established, including Friedreich's ataxia and recessive hereditary spastic paraparesis (SPG7).

The fourth section of the book deals with some contentious and notoriously difficult areas, and the book would not be complete without a section on neurodegeneration and ageing. This is split into three chapters, each of which has a different flavour. The first chapter deals with the cellular mechanisms of mitochondrial disease, focusing on calcium homeostasis, oxidative stress, and protein turnover. This sets the scene for the subsequent chapter on neurodegenerative disease, before a discussion of the various hypothetical mechanisms that could explain the accumulation of mutated mtDNA in normal human ageing. This section has the least appeal for current clinical practice—but it covers an area that is likely to have impact on medicine in years to come.

The final section combines chapters on model systems, genetic counselling, and prospects for therapy. Work on cellular and animal models has had a major influence over the last few years. This is comprehensively reviewed, helping the reader understand some of the difficulties that have plagued the area, and highlighting where future developments will lead to significant advances in out understanding of human disease. The section on transmission, prenatal diagnosis, and counselling is without doubt the most revealing of the clinically relevant chapters in the book. It highlights the problems faced in the genetics clinic, and points towards a number of potential solutions that will undoubtedly influence clinical practice in the near future. The final chapter on gene therapy provides an overview of the different strategies that have been employed but, unfortunately, most of these are still very much at the laboratory stage.

Mitochondrial medicine is a rapidly advancing field and, despite the inevitable delay between manuscript submission and eventual publication, this book provides a solid foundation with a genuinely contemporary feel, at the same time offering a taste of the future. In some ways, the book seems misplaced in a series on medical genetics. Unlike other titles, it is definitely not a clinical book, and in many ways a more accurate title would have been ''molecular genetics of mitochondrial diseases''. This is, however, a minor quibble, and I strongly recommend the book to laboratory and clinical scientists who are looking for a succinct overview of the field of mitochondrial pathology.

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Conflicts of interest: none declared

Chromosome abnormalities and genetic counseling, 3rd edn

Editors R J McKinlay Gardner, G R Sutherland. Oxford: Oxford University Press, 2003, £49.50, pp 596. ISBN 0 195 14960 2 (hardback).

The third edition of this outstanding text is an essential resource for counselling for families with chromosome abnormalities. This book has been extensively updated since the previous edition, with new sections on gonadal cytogenetic damage from exposure to extrinsic agents and pre-implantation genetic diagnosis and substantial revisions to the chapters on uniparental disomy and prenatal diagnosis. Data on individual chromosome abnormalities have been listed for several types of aberrations including autosomal ring chromosomes, uniparental disomy states, and mosaicism for an autosomal chromosome. This feature makes the text a comprehensive reference that covers all aspects of clinical cytogenetics with the exception of cancer cytogenetics. The illustrations include colour plates and computer enhanced figures that facilitate visualisation of the chromosome abnormalities. The authors achieve all this using a very readable style.

This book is particularly strong concerning the mechanistic aspects of cytogenetic rearrangements and also the consequences of parental chromosome abnormalities (for example, autosomal reciprocal translocations) for childbearing. Aspects of counselling for chromosome aberrations are also provided in an interesting and balanced manner. However, there is as yet relatively little information on comparative genomic hybridisation and array comparative genomic hybridisation, two extremely important cytogenetic techniques that are likely to be extensively used in the future. In addition, the discussion on chromosomal and microdeletion syndromes is largely centred on the cytogenetic aspects of these conditions, in keeping with the focus of the book. Still, this book remains a compulsory text for cytogeneticists, geneticists, and genetic counsellors in training and is highly suitable as a reference for other health professionals who encounter patients and families with chromosome abnormalities.

Anne M Slavotinek
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CORRECTION

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The sixth author in the paper by Wilcken *et al*, published in August 2003 (*J Med Genet* 2003;**40**:619–25) is spelt incorrectly: M Redlund should be M Renlund. The authors apologise for this error.