

Book Reviews

Essentials of Genomics and Bioinformatics

Christoph W. Sensen (Editor)

Wiley-VCH, West Sussex, UK; 2002;

ISBN 3-52730-541-6; 420 pp.;

US\$90, €75, £50

'Essentials of Genomics and Bioinformatics' addresses bioinformatics in a broad sense. The book is a collection of mini-reviews, edited by Christoph Sensen of the University of Calgary. These were originally published as volume 5b of the second edition of 'Biotechnology', a multi-volume comprehensive treatise covering all aspects of biotechnology in an encyclopaedia-style format, now republished in a soft-cover format.

The book provides comprehensive introductory-level information across genome research and allied techniques and methodologies. It is divided into five sections:

1. Application Domains (Chapters on genome projects of model organisms, the Human Genome Project, genetic diseases, pharmaceutical bioinformatics and drug discovery and agri-food and genomics).
2. DNA Technologies (Chapters on genomic mapping and positional cloning, sequencing technology and a DNA microarray fabrication strategy for research laboratories).
3. Protein Technologies (Chapters on two-dimensional gel electrophoresis and mass spectrometry for proteomic studies proteome analysis by capillary electrophoresis).
4. Bioinformatics (Chapters on using the molecular biology data, tools for DNA technologies, tools for protein technologies, structure information, genomic data representation through images — MAGPIE as an example and interaction databases).
5. Ethical, Legal and Social Issues (Chapters on ethical aspects of genome research and banking and genomics — five years from now).

Contributions from 52 scientists, both academic and industry-based, are included. The book will be useful to both undergraduate students and teachers, and will provide a good starting point for post-doctoral

researchers new to a particular field. More senior scientists in the field of genomics and bioinformatics may well also find information of interest outside their own specialist field.

The organisation of the book into self-contained chapters renders it practical for dipping into, as for a reference manual. Most chapters are well illustrated, and each is well referenced. Particularly noteworthy is the extensive use of URLs to lead the reader to relevant web-based sources and tools. It would have been useful, however, if a dedicated web page with updates on the URLs had also been provided, as these are prone to change. The book is well laid-out and was a useful and comprehensive index. As well as containing background information and the current state of play, most chapters contain extra sources for further information. Overall, despite containing contributions from over 50 authors, the book remains accessible and well written. An extensive prior knowledge of computing or statistics is not required, as chapters are explained in sufficient detail from basic principles. One slight criticism is that, although covered in some detail in the Human Genome Project chapter, a whole chapter could easily have been devoted to single nucleotide polymorphisms (SNPs). Given the huge amount of interest in developing genome-wide association techniques, and the initiation of the HapMap project, more information in this area would have been useful.

The present book should be regarded as a primer, and not as a comprehensive textbook of bioinformatics and genomics. Several of these are now available, including 'Genomes' (Brown), 'A Primer of Genomic Science' (Gibson and Muse) and 'Discovering Genomics, Proteomics and Bioinformatics' (Cambell and Heyer).

The editor was given a particularly difficult task in producing a book on such a broad selection of topics, and in this case the use of mini-review style articles has succeeded admirably. As pointed out by the editor in the introduction, such a rapidly moving field is undergoing constant change and transformation, and a book such as this can only capture a snapshot of the state of research. Although parts of this book will become outdated very quickly — and indeed may well already not represent the latest developments in certain areas — it does contain a good deal of background information as to how the various fields have developed over the last ten to 15 years. Although more comprehensive coverage of this field is available from the other books mentioned above, this one represents a very useful contribution to the field and is recommended as a good introduction to

a range of topics within the fields of genomics and bioinformatics.

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From Genes to Genomes: Concepts and Applications of DNA Technology

Jeremy W. Dale and Malcolm von Schantz
John Wiley & Sons, West Sussex, UK; 2002;
ISBN: 0-471-49782-7; 372 pp.;
€97.50, £65.00

The self-stated intention of this book is to give the reader a broad introduction to the rapidly moving world of molecular genetics, which has been facilitated by the discovery of techniques enabling laboratories to routinely isolate, manipulate and modify DNA molecules *in vitro*. The task is clearly a formidable one, as the pace of development of new techniques and technologies in molecular biology means that the scope of such a book is potentially huge, providing a quandary regarding what to include and in how much detail to cover it. The authors have risen to this challenge to present a concise text in 17 short chapters, which are clearly written and well structured throughout. The end product is well suited to being a core constituent of recommended course texts for first- or second-year undergraduates requiring schooling in the basic principles and concepts that define molecular genetics. It will be equally useful for those with non-molecular backgrounds working in the life sciences, who will find it a useful entry point to such a jargon-rich field. Those students wishing to specialise in molecular biology or genetics, however, might be better advised to invest immediately in the more comprehensive texts available, such as those by Lewin, or Strachan and Read.

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Each chapter is divided into sections, often covering individual topics that have specialist text books devoted to them. Thus, they cannot hope to cover the techniques or applications of the technology in depth, but the structure provides a clear, top-level summary of the major uses, strategies, pitfalls and advantages of the various techniques. Readers with some knowledge of basic molecular biology will have an advantage, as, inevitably, a certain grounding in the area is assumed. The reader is eased into the subject area with clear explanations, utilising simple diagrams to help comprehension; a useful index and detailed glossary are also provided. The importance of the latter in introductory texts such as this should not be understated, personal experience dictates that it is the frequency of use of specialised terminology that is the most significant barrier for students wishing to comprehend rapidly the field of molecular biology. A significant proportion of many of the chapters is devoted to the coverage, often from first principles, of the enabling techniques and resources that underpin each subject area. There are ample cross-references to other sections for techniques that have multiple applications.

A pleasing and useful feature of the writing style is that phrases covered in the glossary are usually italicised in the body of the text, signalling when the reader can refer to simple explanations of what an *epitope* or an *allosteric replacement* are, for example. The colour scheme is presented predominantly in two-tone purple and black, with shades of grey used when additional differentiation is required. Although this does not detract from the clarity of the figures, lack of colour is perhaps a missed opportunity to add impact to specific features within the figures themselves.

A single notable omission from the book is any suggested further reading material for those students wishing

to delve into greater depth on specific topics. Apart from a brief bibliography containing eight useful reference texts, and a table of websites covering many of the major biotechnology resources such as NCBI, HGMP and TIGR, the reader is left to find his or her own sources of additional information. This is a significant omission, which, if included, would have enhanced the book's utility as an introductory text for undergraduates.

The minor quibbles should certainly not deter anyone from considering purchasing this book, however, particularly if the prospective reader seeks a broad and clear

overview of the concepts and techniques that have enabled the exciting advances in DNA technology to take place. It is extremely well written, attractively sized for an introductory text book and should be recommended for a place in all life-science libraries, where it is unlikely to be left gathering dust on the shelf for long.

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