BOOK REVIEW

'DNA cloning: rise of the robots'

Principles of Gene Manipulation (6th edn)

SB Primrose, RM Twyman and RW Old
Blackwell Science Ltd., Oxford. 2001; 390 pp.
£27.50, paperback. ISBN 0-632-05954-0

Heredity (2003) 90, 415. doi:10.1038/sj.hdy.6800231

Reviewed by C David O'Connor

The year 2003 will celebrate two anniversaries of some significance to geneticists. The first of these – the publication of Watson and Crick's paper on the structure of DNA back in 1953 – will dominate proceedings. It could be argued, however, that the second anniversary, marking the 1973 publication of the Cohen, Chang, Boyer and Helling report of the use of restriction enzymes and DNA ligase (as opposed to homopolymer tailing) to produce recombinant DNA, has had a similar impact. As the authors of this mostly excellent book state: '*there is no subject area within biology where recombinant DNA is not being used and as a result the old divisions between subject areas such as botany, genetics, zoology, biochemistry, etc. are fast breaking down*'.

The integrative trend has of course accelerated with the availability of genome sequences from all domains of life and the consequent realisation that we are not so different in evolutionary terms. However, genomics is also radically changing the way in which gene manipulation is carried out. The sheer scale of the next major challenge in biology – to characterise the functions of the many new genes that are being uncovered – is driving the automation of the entire gene cloning process. The development of robots capable of handling submicrolitre volumes of liquids, coupled with recombinase-based cloning systems (not mentioned in the book) and PCR, will soon make many traditional cloning methods obsolete. For many researchers dropping a particular gene into a vector of choice will become a computer task – witness the rise of the Flexgene consortium. Given these developments, is there still a need for books like this one? I would argue that the answer has to be 'more

than ever'. The authors describe a wide range of solutions to particular gene manipulation tasks, rather than focusing on what is currently in vogue. They have also been careful to include material that is often taken for granted in many publications today (eg plasmid incompatibility and copy number control), but that is essential to prevent new researchers 'rediscovering the wheel'. Consequently, the book remains a valuable reference source.

Now in its sixth edition, *Principles of Gene Manipulation* is obviously quite well-honed and serves the needs of its traditional target readership – advanced undergraduates or early postgraduates – extremely well. It is clear that it would be equally useful to other types of reader requiring lucid and well-balanced descriptions of what can now be done with genes. For example, engineers designing new automated cloning systems would find it useful, as would Biological Safety Officers faced with relatively unfamiliar transgenic technology. Admittedly, it would be necessary to supplement the book with some additional reading if such individuals wanted detailed information on methodologies for genome analysis (the subject of a companion book by two of the same authors), but on the whole the book packs a remarkable amount of information into its pages. I could only spot a few minor mistakes. Contrary to the index, Dolly the sheep makes her appearance on page 214 and the worm that turned was *Caenorhabditis elegans* (Table 1.1). Slightly more contentious is the assertion (p 319) that '*two-dimensional gel electrophoresis is being used to simultaneously study every protein expressed under various conditions*'. If only that were true. The authors note that the new genomics merits a book of its own. I agree – if such a book turns out to be as readable and useful as this one, it will be very good indeed.

C David O'Connor

School of Biological Sciences, University of Southampton
Biomedical Sciences Building, Bassett Crescent East,
Southampton SO167PX, UK
E-mail: docl@soton.ac.uk