

BOOK REVIEW

Gene Cloning: An Introduction

By T. A. BROWN; Chapman and Hall, 1990; 2nd Edition; 286 pp; Price £ 12.95.

Experimental Techniques in Bacterial Genetics

By STANLEY R. MALOY; Jones and Bartlett Publishers, Chapman and Hall Distributors, 1990; 181 pp; Price £ 15.95.

The applications of molecular genetic and recombinant DNA techniques have become so pervasive in the biological research laboratory that there is an apparent need to teach their principles and practice thereof increasingly earlier in the college or university curriculum. It is ostensibly to address the requirement of this category of students and their instructors that the two books under review have been written; both fulfil their respective roles so well that I would not be surprised if, indeed, each of them *creates* the need even in those schools and syllabi where such has not already been felt.

Of the two, *Gene cloning* it is that aims at the wider audience: that of undergraduates fresh out of high school. In this the second edition, the author has tenaciously clung on to the virtues that contributed substantially to the success of the first – an easy narrative style, avoidance of jargon, logical progression from one idea to the next, and brevity. The figures are simple yet rich in visual imagery; and there are nearly 200 of them in a book small enough to be carried in one's lab coat pocket.

Organized in three parts, of which the first is the largest, the book begins with the basic principles of gene cloning (its importance, description of vectors, methods for obtaining and manipulating DNA and introducing it into *E. coli* and other organisms), and takes one through the applications of cloning in gene analysis (methods to clone a specific gene and to study its structure, function and regulation of expression) to its role in research and biotechnology. There is little in the text which one feels could have been omitted, and little again that ought to have been included but has not. The book is self-contained; a diligent student beginning it with but a rudimentary knowledge of DNA structure and of microbiology should, at its end have a fair grasp of the subject and would also, I am sure, have enjoyed herself in the learning process. References to material for further reading are appended to the end of each chapter, but this could perhaps have been made more extensive so that the book could then also have served the cause of students in disciplines outside modern biology undertaking graduate school courses in the subject. There are very few errors in the text, the two notable ones being a figure depicting the curve of electrophoretic mobility as a function of size of DNA which is wrongly drawn on page 182, and the absence of reference to the use of polynucleotide kinase in a section describing methods for end-labelling of DNA restriction fragments.

The second book, *Experimental techniques in bacterial genetics*, comes in the form of a manual (loose-leaf bound), and is meant to serve as the basis for design of an experimental course for advanced-level students on modern techniques in bacterial genetics and molecular biology. The course covers a logical progression of experiments. It begins with the isolation of insertion mutants in *S. typhimurium*, which are then characterized genetically and by Southern hybridization; the students then proceed to clone the relevant wild-type genes and undertake a molecular analysis of each of them by Tn1000 mutagenesis, restriction mapping, detection of plasmid-encoded proteins in maxicells, and DNA sequence determination.

The description of the rationale and methods in each of the experiments is sufficiently clear for the manual to fulfil the role of a student's guide in a course of this kind, but it is not detailed or comprehensive enough to serve as a do-it-yourself book. Alternative methods are not mentioned; the need to have a competent instructor, previously trained in these techniques, to organise the experiments, to provide advice for trouble-shooting, and to interpret and discuss the results obtained, would be keenly felt in any course designed on the basis of this book. Two of the experiments would appear to be unworkable: one on the isolation of regulatory mutants using MudJ operon fusions (experiment 3), because *cis* mutations that increase the translational coupling of expression of the *trpA-lacZ* hybrid in these strains occur at very high frequency; and the other on the use of Tn1000 to mutagenize plasmid-encoded genes (experiment 8), because the donor and recipient strains used in conjugation are not both *rec*⁻, an obligatory requirement in this experiment. One of the strong points in the book is the section at the end of each experiment outlining the manner in which the results ought to be tabulated or described in the student notebooks. I suspect that the book would also find its place on the bench of the research laboratory, because the methods described herein are indeed widely used.

In summary, both the books are useful additions to the bookshelves of practising bacterial and molecular geneticists, and also represent valuable frameworks for the design of teaching courses for undergraduate and graduate students. One would certainly hope that the latter purpose could be achieved with these texts in an increasing number of biology teaching departments in the Indian universities.

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