

BOOK REVIEWS

P. OLIVER

Plasmids: A Practical Approach, edited by K. G. Hardy. IRL Press, 1987. Pp. 192. £15.50, US\$28.00 (soft), £25.00, US\$45.00 (hard).

The IRL Press has produced a series of books, subtitled "a practical approach", which cover the more recent techniques of biological research. The subject of this particular volume is plasmids, those of bacteria in particular. It is fitting that this volume should be published in 1987, this being the twenty-fifth anniversary of the coining of the term by Dr Joshua Lederberg. The term was used to describe a genetic determinant of bacteria that obeyed rules of inheritance, which were different from those of the chromosome. These behavioural rules were given molecular credibility by the discovery of the extrachromosomal nature of plasmid DNA molecules. Since then plasmids have assumed a central position in bacteriological and molecular biological research, interesting for their phenotypic properties and useful as model systems for larger chromosomes. Nowadays their role is somewhat reduced to that of being the artisan in cloning vectors, and many of the more important biological properties of plasmids are overlooked. With so many practical manuals nowadays devoted to the cloning-vector use of plasmids, it is refreshing to find that the subject of this book is almost entirely plasmid biology. Only two of the six chapters deal with subjects that are directly related to cloning. The editor, Dr Kimber Hardy, has chosen five separate plasmid topics and has successfully encouraged the experts in those fields to describe the relevant experimental analysis.

The first chapter is written by Dr Hardy and concerns the isolation of plasmid DNA. Remembering that for this book plasmids are covalently closed circular molecules, the two most popular methods of isolation are described. Another author penned the line "first catch your ..." a particularly apposite phrase. Many scientists experience difficulty with the isolation of plasmid DNA and it would have been useful to have a wider range of techniques described. This should include the use of HPLC, FPLC and pulse field electrophoresis. Plasmid replication (Dr C. Thomas) and incompatibility (Dr P. L. Berquist) are then described, each chapter containing a good selection of the experimental techniques. A chapter on colicins (Dr A. Pugsley and Dr B. Oudega) completes the natural biology of plasmids. The two chapters that are concerned with matters nearer to cloning are on cloning

vectors for Gram-positive organisms (Dr P. J. Youngman) and expression systems (Dr N. Panayotatos).

As each author has described his own experimental systems there is a certain degree of repetition in the methodology. For example, the preparation of plasmid DNA by one method is described by several authors, transposon mutagenesis is popular as is hydroxylamine mutagenesis. It is difficult, however, to correct this without dramatically altering the format of this series of books, which relies upon discrete chapters. The reader will not use the whole book, but will refer only to the relevant chapters. Indeed the chapter in our library copy of Glover's *DNA Cloning*, Volume 1, written by Huynh, Young and Davis, on cDNA cloning bears witness to this fact. The pages are almost falling from the binding.

In summary, I find that this book is a useful addition to the series, describing many techniques not found elsewhere in practical manuals. There may be some idiosyncrasies in some of the recipes, but if they work tinkering would be foolhardy.

Dr Oliver is a Lecturer in Genetics, University of Cambridge.

D. CHAPMAN

Phospholipid Bilayers: Physical Principles and Models, by Gregor Cevc and Derek Marsh. John Wiley and Sons, Chichester, 1987. Pp. xvi + 442. £73.35

The realization that phospholipids are the important molecules that provide the matrix for biomembranes led many scientists over the past 20 years to become interested in these molecules and to study their properties. The fact that phospholipid molecules can undergo phase transitions fascinated the solid-state physicists. Soon theoreticians, spectroscopists, biophysicists and biochemists became actively concerned with the properties of these molecules. Important factors such as fluidity, order parameters and modulation by cholesterol all became central topics of research.

This book by Cevc and Marsh summarizes the present knowledge of the physical properties of these phospholipid molecules. The authors dwell only briefly on the historical development of the subject. The topics dealt with include: crystal structures of phospholipids and their phase behaviour; their self-assembly; their hydration and electrostatic properties. Chapters are included on: solute transport across bilayer systems; inter-bilayer forces and fusion; rotational isomerization of the chains; the nature of the fluid phase and order-parameter profiles; the elasticity

of lipid bilayers and phase separation. This book is completed by a final chapter on non-bilayer phases and the kinetics of lamellar–nonlamellar phases.

The book is well written. It is suitable mainly for biophysicists and physical chemists. It contains a reasonable amount of mathematical support and the

diagrams clearly illustrate the text. It is a good book to have as a reference for most of the topics needed for understanding phospholipid bilayers.

Professor Chapman is Professor of Biophysical Chemistry at the Royal Free Hospital School of Medicine, University of London.