DNAs (bacteriophages ΦX174, M13mp8 and λ, plasmid pBR322 and the animal viruses SV40 and Adenovirus-2). A brief list of DNA and RNA modification enzymes is presented in Appendix 4 while Appendix 5 gives a list of commercial suppliers of equipment and consumable materials.

Although a large number of excellent Molecular Biology Manuals are already available, this reviewer considers that this member of the *Practical Approach* series will find favour in a large number of laboratories especially the ones with aspiring or less experienced molecular biologists. The book has been written with the care and attention expected from this well-known series of laboratory books.

Demetris Savva

Oligonucleotides and Analogues: A Practical Approach; Edited by F. Eckstein; IRL Press at Oxford University Press; Oxford 1991; xxiv + 313 pages. £22.50

Chapter 1 entitled 'Modern machine aided methods of oligodeoxyribonucleotide synthesis' sets the scene for the entire volume. It explains the basic chemistry behind oligonucleotide synthesis, containing both an informative description and commentary on how the technique has evolved from earlier beginnings to make the chemistry simpler and more efficient, and generally less hazardous. A section described as 'a practical guide to automated DNA synthesis' is what a book of this type is all about and provides plenty of the necessary 'What to do...' instructions. The final section discusses limitations of solid phase deoxyribonucleotide synthesis and draws attention to the effects of the various side reactions that can occur during the process and emphasizes the need to purify rigorously the final, desired reaction product.

A subsequent description of the synthesis of oligoribonucleotides complements this beginning and discusses the difficulties of coping with the extra 2'-hydroxyl group on the ribose. A number of chapters then go on to describe the synthesis of oligonucleotides with modifications to the phosphodiester backbone, the bases or the sugar residues and numerous examples are given of the chemical properties and usefulness, both real and potential, of the different molecules considered. Some of the advantages are general, such as being resistant to nucleases, whereas others are more specific. For example, DNA-RNA duplexes containing 2'-*O*-methyl oligoribonucleotides are not a substrate for RNase H and oligonucleotide phosphorodithioates are stereospecific achiral molecoles, whereas phosphorothioates, phosphoramidates and methyl phosphonates are all phosphorus chiral, so that a number of non-resolvable diastereoisomers results during their synthesis. The list of proposed functions for such molecules in biological research is impressive and includes studies on enzyme biochemistry, autolytic processing of RNA (ribozymes), interactions with proteins, oligonucleotide-directed mutagenesis, affinity chromatography and antisense molecules, these having considerable potential value for therapeutic use.

The later sections in this volume discuss the attachment of various reporter groups to the oligonucleotide. These are usually non-isotopic and facilitate detection by fluorescent, chromophoric or chemiluminescent methods. Procedures are given for attachment of appropriate ligands to various parts of the oligonucleotide. Modification of the 5'-terminus leaves the 3'-terminus free for enzymic manipulations as required for Sanger sequencing and for PCR amplification applications. Site specific attachment of reporter groups to the phosphodiester backbone is also possible and an example is given of the preparation of site-specifically labelled tryptophan operator oligonucleotides used to examine binding of repressor protein. The use of reporter groups throughout the oligomer by attachment to bases has created hybridization probes with detection sensitivities exceeding those of ^{32}Phosphorus. Finally, the use of DNA intercalators and photoreactive agents as ligands allows some desired chemical change to be effected at specific target sites.

The value of oligonucleotides is thus now well established and as to future developments it is clearly a case of 'watch this space'.

This is an excellent update on the 1984 Gait publication in the series offering much, not only for the experienced hand, but also for the newcomer who may not be aware of the variety of oligomers that can now be made or the uses to which they can be put. As practical manual, however, its true worth cannot be known until people attempt to follow the instructions contained within it.

Colin K. Pearson

Making Monoclonals; By D.G. Newell, B.W. McBride and S.A. Clark; Public Health Service Laboratory (distributed by Cambridge University Press); London, 1991; viii + 94 pages. £10.00 (pb)

With the production of monoclonal antibodies having become an industry rather than an art an inevitable consequence has been a range of publications decribing both the method itself and its associated techniques. These vary from comprehensive protocols as found in immunological compendia such as Harlow and Lane's 'Antibodies: A Laboratory Manual' (Cold Spring Harbor Lab., 1988) to several detailed beginner's guides. The small volume by Newell et al. is one of the latter and from the first page the authors make it clear that their aim is to aid the novice in producing monoclonal antibodies specifically to infectious agents for subsequent use in immunodiagnostics.

The book has six chapters covering each stage of the process in

logical operational order, viz. immunisation, fusion, screening, large scale production, antibody characterisation and immunodiagnostics. The first chapter is orientated towards handling bacteria and viruses and components thereof for immunisation purposes, whilst the others could be applicable to producing antibodies to most antigens. Apart from the last chapter where a summary of diagnostic kits and their possible commercial exploitation is provided, the information given is extremely detailed and 'user-friendly'. A major feature is the advice (and reasons) on experimental and safety techniques which accompanies many of the practical steps, e.g. the need to avoid plastic syringes when handling adjuvants because of the swelling of the plunger.

The book has a publication date of 1988 and hence has a pre-1987 reference list. Of other current techniques, in vitro immunisation is described but one would not expect to find human hybridomas or 'humanised' antibodies in such a book. However, the commercial availability of chromatographic kits for antibody purification has been missed. There are a few errors in the text and a major mislabelling of photographs of cells has led to an loose erratum sheet being inserted after publication. A second edition might also deal with minor issues such as defining the term antibody 'avidity' as the novice might expect 'affinity' to be used instead. Likewise, it took some minutes to realise what was meant by a 'blank sample comb' for use in SDS-PAGE.

In terms of price and content the book is a good buy for those interested in infectious diseases. For more general and current coverage of monoclonal antibodies readers may prefer to consult recent texts such as 'A Practical Guide to Monoclonal Antibodies' by J.E. Liddell and A. Cryer (Wiley, 1991) or A.M. Campbell's approach in 'Laboratiry Techniques in Biochemistry and Molecular Biology, Volume 23' (Elsevier, Amsterdam, 1991).

A.J. MacGillivray

Liquid chromatography in biomedical analysis (Journal of Chromatography Library–Volume 50); Edited by T. Hanai; Elsevier; Amsterdam, 1991; xii + 296 pages; Dfl 270.00, $154.50

This book attempts, in my opinion successfully, to describe the potential role of HPLC in all types of biomedical analysis.

The introductory chapter gives a comprehensive overview of practical liquid chromatography, describing sampling techniques, type of sample (including a welcome appreciation of the problems encountered with plasma), and sample preparation, including the now widespread solid-phase extraction techniques. The HPLC section describes the separation chemistries available to the chromatographer, including more recent developments such as porous graphitic carbon.

Chapter two describes optimisation techniques with considerable mathematical analysis of both separation chemistry and analyte behaviour. There are sections dealing with most categories of biomolecule, and separation chemistries applicable to each. There is also discussion of predictive techniques. It's a pity that the elution of peptides on HPLC is not discussed here as the author claims that peptides are more predictable than amino acids in their retention characteristics.

Subsequent chapters deal with individual classes of biomolecule, beginning with amino acids, and including bile acids, carbohydrates, catecholamines, fatty acids, nucleotides, porphyrins, prostaglandins and steriod hormones. The final chapter covers a variety of miscellaneous molecules not covered in the main text.

Each chapter describes in considerable detail how a routine system can be devised for clinical analysis. Derivitization chemistry and methods of detection are described. It is refreshing to see that the HPLC results presented are from real samples, allowing discussion of such phenomena as spurious peaks, baseline drift, peak overlap, and so on. Most chapters also deal with the problems of devising automated or semi-automated systems. Overall the emphasis is very much on understanding the principles which are routinely employed in HPLC. Every worker who uses an HPLC, whether for research or routine analysis wil find (as I have done) that there is something of value in this volume.

My only major criticism, besides the rather high price, is that many trade products described are Japanese, which is obviously not surprising as the majority of contributors are Japanese. However, for distribution in Europe, a list of equivalent products would be useful. A glossary of HPLC terms would also help, as some contributors use different terms to define analyte behaviour.

The book itself is more easily accessible than some of the very large HPLC manuals which have appeared recently, and its emphasis on real problems encountered with real samples makes it a volume which will be continually consulted.

John L. Morton

Novel Calcium-Binding Proteins: Fundamentals and Clinical Implications; Edited by C.W. Heizmann; Springer-Verlag; Berlin, 1991; xii + 624 pages. DM 248.00

The calcium ion (Ca^{2+}) has a fundamental role in regulating a variety of cellular functions. One mechanism whereby Ca^{2+} exerts its effects is by interacting with a variety of Ca^{2+}-binding proteins. In the book 'Novel Ca^{2+}-Binding Proteins: Fundamentals and Clinical Implications' attempts have been made to summarize recent developments in the identification and characterization of Ca^{2+}-binding proteins. Followed by a preface emphasizing the role of Ca^{2+}-binding proteins not only in physiology but also in pathophysiology, the book is divided into six sections dealing with: Calcium signaling by calcium-binding proteins; EF-hand calcium