

PUBLICATIONS

NUCLEIC ACID COOKBOOK

***Oligonucleotide Synthesis: A Practical Approach.* Edited by M. J. Gait. Pp. 217. ISBN 0-904147-74-6. \$20.00. (IRL Press, Oxford: 1984).**

Anyone currently struggling to put together a grant justification for an all-singing, all-dancing DNA synthesizer would do well to obtain a copy of this book without delay. Not only does it contain a wealth of detailed coverage of the methods available for DNA synthesis and the myriad factors that may make the difference between success and failure, but it also provides a set of clear step-by-step protocols for carrying out DNA synthesis, without a machine, in the event of your grant application failing.

The book is so comprehensive a guide to the black art of DNA synthesis that even a severely abbreviated list of the topics covered would run to several pages. The major headings include methods of synthesis by both phosphotriester and phosphite triester chemistries, purification of synthetic sequences by H.P.L.C., gel electrophoresis or T.L.C., and sequence analysis, and there are useful sections on the even blacker art of RNA synthesis. For the very adventurous, or the fiercely independent, there is even a section on preparation of protected monomers. Digging a little deeper after the initial browse through the manual's 200-odd pages, the reader will find discussion of the relative merits of the various solid-supporters available, of the utility of nucleoside-specific colored triaryl-methyl protecting groups, the virtues of pixyl protection rather than dimethoxytrityl, the advantages of dialkylaminomethylene protection on deoxyadenosine, and even an appendix devoted to H.P.L.C. column packing techniques. Other appendices describe general laboratory techniques for the benefit of the novice biologist-turned-chemist, and lists suppliers of materials and equipment for DNA synthesis and purification, while the Introduction includes an excellent discussion of "pitfalls for the unwary" and a useful trouble-shooting flow chart for tracing problems encountered during a synthesis. The introduction also covers applications of

synthetic oligonucleotides and the selection of the optimum synthetic strategy, besides explaining the reasoning underlying protecting group selection and solid-phase methods, and contains a heartfelt plea for the long-overdue standardization of the meaning of the word "yield", together with a set of concise definitions that will hopefully gain universal acceptance.

Inevitably, as in any multi-author work, there are the occasional inconsistencies. Brian Sproat and Mike Gait, for example, correctly caution against distillation of pyridine from calcium hydride since this produces secondary amines, while the authors of two other sections of the manual actually recommend this procedure. Similarly, two different procedures

for assay of the dimethoxytrityl group are presented, both presumably valid, although in one an obvious but potentially critical misprint—of the wavelength for absorbance measurement—has sneaked past the proof-readers.

On the whole, however, the book is commendably error-free, and should prove indispensable to anyone involved in DNA synthesis. Indeed, given the modest price of the manual and the rate of expansion of the field it covers, it is difficult to see how it can avoid becoming a standard undergraduate text within a year or two.

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