

DNA structure; 'universal probes' for DNA hybridisation; unidirectional deletion of DNA with Bal31 nuclease using 2-O-Me RNA-DNA chimeric adaptors; sequence-specific cleavage of RNA using chimeric DNA splits and RNase H. At the biological end, as well as details of new methods for constructing chimeric genes and novel expression vectors a new transfection technique is presented which involves polybrene, and which is a hundred-fold more effective than with DNA-

calcium phosphate and does not require carrier DNA.

On balance this volume would certainly be a useful buy for the research laboratory, but probably of less value as a personal purchase. There are certainly some useful technological advances described but some of these may well appear elsewhere in the fullness of time.

R.H. Burdon

Micro-algal Biotechnology

Edited by M.A. Borowitzka and L.J. Borowitzka

Cambridge University Press; Cambridge, 1988

x + 477 pages. £45.00, \$79.50

This book reflects an increasing awareness of the potential of microalgae, including the prokaryotic cyanobacteria, for biotechnological exploitation. It aims to provide a comprehensive introduction to existing and potential applications, with emphasis on processing, engineering and genetic engineering. Three sections of in all 16 chapters, mostly single-author, deal with: the algae; products and uses of micro-algae; and the technology of micro-algal mass culture.

The first section deals with five algae of major importance in the context of biotechnology; *Chlorella*, *Dunaliella*, *Scenedesmus*, *Spirulina* and *Porphyridium*, with the sixth chapter encompassing the species of lesser importance. A general pattern of dealing in turn with taxonomy, morphology, ecology, cell composition and culture is followed. The coverage is indeed comprehensive and little of significance to 1986 seems to have been omitted. The inclusion of half-tone plates of the organisms would have been appropriate, but were presumably precluded by publication costs, balanced against potential sales. Elsewhere, labelling of figures of production facilities would sometimes have helped correlation to the descriptions in accompanying legends, but the presentation otherwise is good with few errors.

The second section on products and uses covers

vitamins and fine chemicals, lipids and hydrocarbons, in the first category and aquaculture, agriculture, food consumption, and waste-water treatment in the latter. The order of presentation of the six chapters would have benefitted from rearrangement. Again, the treatment is comprehensive, but with concentration seemingly on kilogramme production targets the value of micro-algae as sources of a number of very high-value products (e.g. restriction endonucleases) seems to have been overlooked. Another omission is a discussion of the potential of immobilized cells, where some interesting work deserves mention. Throughout the book, appropriately, there are intriguing insights into economic considerations; here, a potential wholesale value of *Porphyridium* phycoerythrin, which is estimated at \$50 kg⁻¹, contrasts markedly with a current selling price of \$90 mg⁻¹ for the purified protein!

The final section of 4 chapters, opened by a discussion of growth limitation, goes on to the practicalities of mass culture and harvesting, and the potential of genetic engineering; again all sound stuff if maybe not the material of best-sellers.

My overall view of the book was favourable. It is authoritative and constitutes a valuable reference text. Acquisition of a personal copy will

be useful to those biologists interested in algae and their potential, and to biotechnologists in general. On this basis it could, in addition to library pur-

chases, attract an interdisciplinary readership, though perhaps not a large one.

Lyndon Rogers

An Introduction to Radioimmunoassay and Related Techniques (Third Edition)

Laboratory Techniques in Biochemistry and Molecular Biology

By T. Chard

General Editors: R.H. Burdon and P.H. van Knippenberg

Elsevier Science Publishers; Amsterdam, 1987

xvi + 274 pages. Dfl.79.00, \$35.00 (paperback); Dfl.257.00, \$109.00 (hardback)

If old George were asked at the village cricket match whether or not the bowling was accurate, he might well reply: "Nay lad, it's all over place," or words to that effect. However, careful inspection would probably show that balls bowled to leg and off of the stumps were produced with equal frequency so that the net average ball, from a scientific point of view, was perfectly accurate and on target. What George should have said was: "Nay lad, it's a bit imprecise today." Precision and accuracy are everything to the immunoassay buff and these and other far more complicated concepts are beautifully demystified in this little pocket paperback.

Actually, there is a bit of a rumpus going on at the moment about this word 'accuracy'. The younger assayists feel that old George may have a point and that lay feelings about the word should be respected. They have therefore come up with the following revision:

New 'accuracy' =
the square root of (old 'accuracy'² + precision²)

Got it? No? Well, the author was not over the moon about it either. And to add insult to injury the young bloods are suggesting that the word 'bias' replace old 'accuracy' – a strange choice for a term meaning: degree of approximation to the truth.

Getting back to the book, there is a mountain of

useful information about radioimmunoassay (RIA) here. For reference and trouble-shooting in laboratories doing this sort of work routinely, it should be invaluable. And for those contemplating development of one of the traditional polyclonal antibody RIAs, every angle is considered, every aspect covered and no stone is left in peace to trip up the unwary. However, there is a distinctly backward-looking feel to it all. For example, only 4 of the 274 pages are devoted to monoclonal antibodies. The methods for using them and the problems arising are largely ignored. But surely, you will exclaim, the future for immunoassays lies with the infinitely reproducible and consistent monoclonals. Week by week their diversity expands and week by week they become cheaper and more generally available. I would agree and would add that the very demands of accuracy and precision extolled by the author will require their use in the not too distant future.

Another niggler before finishing – what about ELISA? Enzyme-linked immunoassays are indeed mentioned but only in the introductory chapters. Theoretical analysis, setting up the technology and problems in use are absent. This despite the fact that most new immunological assays being developed these days utilise the ELISA concept. It is cheaper, safer and often quicker than RIA. Sermon ends.

C.J. Chesterton

Publisher: Cambridge University Press. Online publication date: June 2012. Print publication year: 2007. Biotechnology, especially of the microbiological variety is so closely linked to its scientific roots as to make for a seamless continuum. Nowhere is this more vividly demonstrated than in the second edition of *Microbial Biotechnology*, written by two leading scientists who have made stellar contributions to microbiology and biochemistry. This book, based on their authoritative insights and experience, unites the 'bio' and 'technology' in a masterful way. This is what we expected from the update of a classic in its field.' Moselio Schaechter - Adjunct Professor, San Diego State University. Michael A. Borowitzka. Algal Biotechnology Laboratory School of Biological and Environmental Sciences Murdoch University Murdoch, W.A. 6150 AUSTRALIA. Introduction. The green unicellular flagellate *Dunaliella salina* Teodoresco is the richest natural source of the carotenoid β -carotene (Borowitzka, MA and Borowitzka, 1988 a). The halophilic species of *Dunaliella* also accumulate very high concentrations of glycerol (Borowitzka, LJ and Brown, 1974; Borowitzka, LJ, 1981 b). *Dunaliella salina* was first proposed as a commercial source of B-carotene by Massyuk (Massyuk, 1966) and later as. Borowitzka MA and LJ Borowitzka (eds) 1988. *Micro-algal Biotechnology*. Cambridge University Press, Cambridge. Google Scholar. 15. Borowitzka MA and LJ Borowitzka. 1988. *Dunaliella*. In: *Micro-algal Biotechnology* (MA Borowitzka and LJ Borowitzka, eds), pp 27-58, Cambridge University Press, Cambridge, UK. Google Scholar. 16. Laws EA and JL Berning. 1991. A study of the energetics and economics of microalgal mass culture with the marine chlorophyte *Tetraselmis suecica*. Implications for use of power stack gases. *Biotechnol Bioeng* 37: 936-947. Google Scholar.