

Book reviews

DNA Repair and Recombination. T. Lindahl and S. C. West (eds). Chapman and Hall, London. 1995. Pp. 103. Price £40, hardback. ISBN 0 412 64040 6.

In the summer of 1994, a meeting organized by Thomas Lindahl and Stephen West was held at the premises of the Royal Society to discuss recent progress and ideas on DNA repair and recombination. The 1990s has been an extraordinary period for DNA repair in particular, with the topic moving from something of a minority interest to a point where the link between a repair defect (in mismatch repair) and cancer (Hereditary Non-Polyposis Colon Cancer, HNPCC) has been proven beyond doubt. The totally unexpected and intimate link between repair and transcription has been established, and the DNA repair enzyme has been voted 'molecule of the year' by one prestigious journal. Quite how much of this the organizers were aware of before the meeting was organized I am not sure, but their foresight was rewarded with a meeting of exquisite timeliness. British Rail once again did their best to make attendance at the meeting difficult with a series of strikes, but they failed miserably and the hall was full to listen to the great and the good present their research data. Following the meeting, as is the norm, the presentations were published as a collection of papers, edited by the meeting organizers, and that is the origin of this book.

What we have then is a collection of up-to-date (as of 1994) reviews written by the leaders in their field, and touching on almost every area of DNA repair and recombination. The book is not a comprehensive treatise on these topics — it could not be with just 14 chapters and 100 pages to cover the material. Compare that with the 700 pages Errol Friedberg takes to cover DNA repair in his excellent new text book (*DNA Repair and Mutagenesis* by Errol C. Friedberg, Graham C. Walker and Wolfram Siede, ASM Publications, Washington, 1995) and you will get the idea. What we find here are reviews that move as near as possible (give publication delays) to the forefront of current research and which present an overview that must surely stimulate the most jaded intellect. To be sure, much of the material in the book has now been published in the primary literature and if you need the experimental details you must go and look there. However, if you want reviews of recombination (from the labs of Charles Radding, Gerald Smith, Stephen West and David Lilley) then they are here. The role of recombination in circular chromosome segregation is reviewed by David Sherratt *et al.*, V(D)J recombination is discussed by Martin Gellert

and J. Fraser McBlane, and Kathleen A. Smith *et al.* mull over the role of recombination in gene amplification. If your preference is for DNA repair then enzymes that act at strand interruptions in DNA (primarily poly-ADP ribose polymerase) are illuminated by Thomas Lindahl *et al.*, while nucleotide excision repair in yeast is explored by Errol Friedberg *et al.* The equivalent mammalian NER processes are dissected in consecutive papers, each with its own distinctive bias, by Richard Wood and Dirk Bootsma *et al.* before David Lane *et al.* expound on the role of p 53 in DNA repair. The current picture of the biochemistry of mismatch repair is then presented by Paul Modrich, before the coup de grace is supplied by Miroslav Radman with a much more discursive article on the role of repair processes in general (and mismatch repair in particular) in evolution. Miroslav is often asked to give the final talks at repair meetings because of his well-deserved reputation for stimulating and imaginative presentations. He does not let us down here and the same can be said for the whole book which provides an excellent starting point for anyone interested in these topics.

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Practical Skills in Biology. Allan Jones, Rob Reed and Jonathan Weyers. Longman Scientific and Technical, Harlow. 1994. Pp. 294. Price £14.99, paperback. ISBN 0 582 06699 9.

Practical Skills in Biology is aimed at the life science undergraduate; there are no two ways about it. It is basic, clear, concise and covers everything from 'Do Not Eat/Drink/Smoke in the Laboratory', to techniques in genetic engineering. First impressions suggest that the book does seem a little too basic, but as is stated in the preface, more students are coming to university from increasingly diverse backgrounds and this book caters for all.

Students with an A level in biology under their belt will probably find the introductory chapters all a bit too

obvious, but there are enough advanced skills in the later chapters to keep them happy. The opening chapters contain topics such as health and safety, basic laboratory techniques, and measures and units. Like the rest of the book, these sections are thoroughly covered and include good notes on solution chemistry, molarity, pH and buffers. It has just enough chemistry to let you get by, without confusing the issue.

There is an important chapter on 'The Scientific Approach' that explains to those without the necessary background how 'scientists' conduct experiments, including the use of suitable controls and making the correct observations. These are important skills as most practical work has to be written up, and needs to be in the correct format. This is probably more valuable for students without a scientific background, but a refresher course is always useful!

The microbiological section contains many techniques that are not covered by A level biology (at least not by this reviewer's course), such as microbe identification, gram staining and biochemical tests. You are more than likely to use light microscopy, and proper specimen preparation is an important skill to acquire. Most of these procedures will be covered by a life science foundation course, but the handy hints given in this book will keep you one step ahead of the rest. Cell culture techniques and obtaining single colonies by streak dilution are essential for any prospective microbiologist, and although these will be taught by your lecturers there is no reason why you can't read about them first. The book in no way replaces practicals so you can't buy it in order to skip lessons. Having said that, in most classes the sooner you get it right, the quicker you can leave!

Being a geneticist, I was a little disappointed with the six pages of genetic engineering techniques, but they have managed to squeeze in all the important ones such as extraction and purification of DNA, gel electrophoresis, DNA amplification using the Polymerase Chain Reaction, restriction digestion, Southern blotting and transformation of cells. The book outlines the principles behind these techniques and, although it does not give step-by-step instructions, it does give useful hints.

Other more advanced topics such as immunological assays, including enzyme-linked immunosorbent assays (ELISA), enzyme studies and the use of radioactive isotopes are also covered, as are polarography, centrifugation, spectrophotometry, chromatography, analysis and presentation of data, statistical tests, communication skills, the list goes on ...

This book really does cover a remarkable number of topics, many of which will be new to the inexperienced undergraduate, and will probably do well as a companion to foundation course practicals and beyond. The authors admit that it does not provide a detailed recipe-like solution to every problem, but then no more is required at this stage. As it is, there are no hard and fast rules for experimental design and most techniques will need to be modified according to what you're doing. With this in mind, it is probably better to give the under-

lying principles in preference to the more adaptable protocols.

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Speciation and the Recognition Concept: theory and application. D. M. Lambert and H. G. Spencer. The Johns Hopkins University Press, Baltimore. 1995. Pp. 502. Price £29.00, paperback. ISBN 0 8018 4741 9.

A few years ago I read an article about the dangers of using citation analysis as a means of identifying quality publications. Among other problems, the author pointed out that papers which are wrong, or promulgate a mistaken theory, can receive high citations as a result. The example he gave of a manifestly false theory giving rise to high citations was Paterson's recognition concept.

Paterson will have achieved a considerable further increase in his citation rate following the publication of this book. It consists of 20 essays which examine the concept from a variety of angles, varying from the philosophical to the practical.

I have always been deeply sceptical of the usefulness of the recognition concept, and of its superiority to the Biological Species Concept as a means of defining and delimiting species in practice. I found this book clarified many of the issues, even if I remained sceptical at the end.

Nearly every chapter defines both species concepts, with subtle differences from chapter to chapter. Generally the Biological Species Concept ('isolation concept') is said to include both a species definition (such as 'groups of actually or potentially interbreeding natural populations which are reproductively isolated from other such groups'), and the hypothesis that the mechanisms producing the isolation can be actively evolved for that purpose (so-called reinforcement). I believe this lampoons the Biological Species Concept, and conflates the concept (groups of independently evolving organisms) with the process (speciation) during which the isolating mechanisms evolve. Reinforcement is not a necessary part of the Biological Species Concept, even if it was actively advocated by its original proponents, e.g. Mayr and Dobzhansky. The number of references in this book to early works by these giants distorts current thinking about the role of reinforcement in speciation. Even in 1937 Dobzhansky (Dobzhansky, 1937, p. 258) recognized that isolating barriers are most likely to have spread because of pleiotropic properties other than those involved in isolation (i.e. speciation is an effect, rather than being actively evolved as such), and certainly by 1970 it is clear that he recognized that reinforcement is not necessary,