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Book Reviews

DNA Replication and Recombination

UCLA Symposia on Molecular and Cellular Biology – New Series, Volume 47

Edited by R. McMacken and T.J. Kelly

Alan R. Liss; New York, 1987

812 pages. £90.00

This volume in the UCLA Symposia series contains articles representing the interests of some 500 participants who attended the meeting, held in Utah, USA, 1986. Previous meetings on these topics were held in 1980 and 1983.

Although the title is 'DNA Replication and Recombination' some two-thirds of the articles contained in the volume concern DNA replication. Many of the topics covered are well-recognised and established; for example, there are sections on the enzymology of replication, with some emphasis on *E. coli* DNA polymerase III, multi-protein replication systems, origins of DNA replication and the genetics of replication. What is exciting, however, is to see the advances which are being made in these established areas in terms of a more detailed understanding of the molecular events taking place in the various component parts of the DNA replication process.

A wide variety of in vitro systems are described for reconstituting replication systems and for investigating protein-protein and protein-DNA interactions during replication. Many of these are of prokaryotic origin (*E. coli*, bacteriophages, plasmids), but eukaryotic systems are represented too, particularly yeast and SV40. There are very few papers dealing with higher eukaryotes, including mammalian systems, reflecting that the central theme was to be on molecular mechanisms.

Important advances in the field are being supported by the application of some 'high-tech.' methodologies such as NMR, X-ray crystallography and laser crosslinking as well as DNA recombination procedures. The laser, for example, has been applied to a bacteriophage T_4 replication system in vitro to investigate transient interactions between replication proteins and DNA. Working on a faster than microsecond time scale the method can 'fix' transiently contacting DNA and protein components by forming covalent crosslinks between them.

Recombination is covered under two headings: (1) Mechanisms of general recombination and (2) Transposition and site-specific recombination. Many articles under the former heading are concerned with RecA protein. In the second case several types of transpositions have been worked out, a number of in vitro systems established and component enzymes of the various events are now being characterized.

The volume is quite substantial with over 700 pages. None of the articles is very long and since the print

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is generally large and well-spaced out (papers are photocopies of typescript) they are very easy to read or scan quickly to find relevant information. A summary of the proceedings by Nicholas Cozzarelli provides a very convenient starting point.

This is an impressive collection of recent research findings in these related fields of DNA replication and recombination and will provide an invaluable source of information for researchers and teachers alike, albeit at a cost of £90 per volume.

C.K. Pearson

Gene Amplification and Analysis

Vol.5, Restriction Endonucleases and Methylases

Edited by Jack G. Chirijian

Elsevier Biomedical Press; Amsterdam, New York, 1987

x + 303 pages. $65.00, Dfl.200.00

This is the second volume in this series to be devoted to restriction endonucleases. Other volumes include one on structural analysis of nucleic acids, one on oncogenes and one on gene expression. While it is clear that some of these topics do indeed conform to 'Gene Analysis', I am not as clear as to where the amplification comes in. The Editor argues that in the five years since the first volume, the field of restriction enzymes has moved on sufficiently to justify a second volume on this topic. While it is true that there is a large amount of new information, I am not sure that much of it will be used by those who simply use restriction enzymes for gene analysis. I suspect that what interests them most is the commercial availability of enzymes recognising new sequences. With this point in mind the first two chapters in this book by Roberts and by Blakesley are undoubtedly useful. Chapter 1 is a complete list of more than 600 different enzymes containing over 100 different recognition specificities. The chapter by Blakesley really does little more than to recategorise these but now classifying them by recognition sites rather than alphabetical order of the enzyme. In practice, of course, most readers will only be interested in those enzymes which are readily available and either of these two chapters would therefore benefit enormously from just some indication of which these enzymes are. The two chapters together occupy a third of the book and so the potential purchaser is effectively paying $20.00 for information which he or she can usually obtain free of charge from the companies who market these enzymes. You have to be very much an aficionado of the restriction endonuclease field to really want information about 500 enzymes which cannot be purchased.

Bearing in mind that there are indeed several hundred enzymes available but only a dozen chapters or so in each book in which to discuss them, it does seem odd that the enzyme *Eco*RI which occupied three chapters in volume 1 still merits a further two chapters in volume 5. While there is little doubt that this is far and away the best studied enzyme, I am still not clear that a potential gene analyser needs quite so much information about it. The same type of argument applies to chapter 5 which concerns *Bam*HI and spends two pages describing how to purify it. Since *Bam*HI is one of the cheapest enzymes available I would be very surprised if many people want to make large scale amounts of it themselves. Having said that, the crystallisation of *Eco*RI with a substrate oligonucleotide bound at its active site was a major breakthrough and it is a great pleasure to have a review from the laboratory which achiev-