
 Book Reviews

Old, R.W.; Primrose, S.B.: **Principles of Gene Manipulation**. An Introduction to Genetic Engineering. Studies In Microbiology Volume 2.

Oxford, London: Blackwell 1980. 138 pp., 9 figs., 10 tabs. Soft bound £ 5.50

The seventies will be known in the history of molecular biology as the decade in which recombinant DNA technology was developed. The discovery of type II restriction endonucleases ushered in this period. Many of these restriction enzymes have now been isolated and with their use discrete DNA fragments of defined length and sequence can be obtained from any DNA molecule. These well-defined pieces of DNA can be joined with DNA fragments carrying a suitable *origin* of replication which allows the recombinant DNA to be maintained in cells transformed with this DNA. This method has been named the molecular cloning of DNA. In addition, the wide variety of restriction enzymes has made it possible to sequence DNA in a relatively simple way. These developments have opened up the possibility of studying for the first time in a detailed way gene organization, structure and expression in eukaryotes with their large genomes. Equally important, recombinant DNA research also has contributed enormously in deepening our knowledge of prokaryote molecular biology, as the authors rightly note. Apart from being a powerful tool in science it will certainly be applied in the near future to commercial production in industry and agriculture.

In my view the authors of 'Principles of Gene Manipulation' have succeeded in preparing a superb comprehensive overview on all the well-established techniques in recombinant DNA research. The concepts are well explained, making use in each case of those basic principles from molecular genetics and molecular biology that are required for a quick understanding of the matter. The different aspects are conveniently arranged, well-written and illustrated, which makes the book easy to read. Although several publications have appeared on the progress and the application of genetic engineering a review on the technology of recombinant research did not yet exist. This book is very well suited for undergraduate courses on gene manipulation and can also be recommended to all those people who plan to do research in this area. It not only deals with classic work with *E. coli* but also discusses the

possibilities of using *Bacillus* spp and such eukaryotes as yeast and animal and plant cells. I feel, however, that a few things on gene identification and gene expression could have been included for completeness, e.g. transposon mutagenesis and the use of *E. coli* maxi cells as an alternative for mini cells in order to study the expression of recombinant plasmids. Since rapid progress can be expected to occur in the near future, especially on recombinant research with eukaryotic cells, I hope that the authors are willing to include new developments in later editions of this valuable book.

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Akin, E.: **The Geometry of Population Genetics**. Lecture Notes in Biomathematics, Vol. 31.

Berlin, Heidelberg, New York: Springer 1979. 205 pp., 1 tabs. Soft bound US \$ 13.80

Single locus models have been predominant in much of theoretical population genetics. Unfortunately, one of their major virtues, simplicity, is also tied to one of their major shortcomings. Certain results such as Fisher's Fundamental Theorem do not even strictly hold for two locus models. The goal of the monograph by Akin is to understand the role of Fisher's Fundamental Theorem and epistasis in multi locus models. Mathematical techniques from differential geometry are used, building upon earlier work by Shashani, Nagylaki and Conley.

The author stresses two major results, a mathematical definition of epistasis that applies to frequency dependent models as well as constant fitness models, and the possibility of cycling in two-locus two-allele constant selection model. Unfortunately, the latter results depends on the inclusion of position effects, non-equal fitnesses of coupling and repulsion heterozyotes.

The book is most valuable as the development of a framework for future research (by mathematically skillful workers) rather than for its current results, which do not contribute greatly to evolutionary theory. The book is also addressed basically to a mathematical audience; even sections addressed to biologists require an extensive mathematical background. The approach taken may lead to more important results in the future, however.

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