

Gene Cloning and DNA Analysis

An Introduction

The traditional technique for gene cloning involves the transfer of a DNA fragment of interest from one organism to a self-replicating genetic element, such as a bacterial plasmid. This technique is commonly used today for isolating long or unstudied genes and protein expression. A more recent technique is the use of polymerase chain reaction (PCR) for amplifying a gene of interest. The advantage of using PCR over traditional gene cloning, as described above, is the decreased time needed for generating a pure sample of the gene of interest. However, gene isolation by PCR can only amplify genes with predetermined sequences. For this reason, many unstudied genes require initial gene cloning and sequencing before PCR can be performed for further analysis. Sequencing uses biochemical methods to determine the order of nucleotide bases (adenine, guanine, cytosine, and thymine) in a DNA oligonucleotide. Knowing the sequence of a particular gene will assist in further analysis to understand the function of the gene. The book provides in-depth coverage of all major topics in this area. The book commences with an introduction to different tools used for Gene cloning. The purpose of this book is to provide an insight on theoretical aspects of Recombinant DNA manipulation with special emphasis on different procedures to create chimeric molecules using examples from actual experimental works. The book has been designed for under-graduates, post-graduates and technicians who wish to know and use the principles and techniques of Gene cloning.

About the Editor

Dr. Hansie Peterson BSc, PhD in Genetic engineering and works at the University of Agriculture, Durban, SA. He has written a number of undergraduate textbooks on Gene Cloning and DNA analysis.



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