

Preface

The first edition of this book was published in 2002. At that time the revolution in molecular biology, with *gene cloning* at its heart, had already progressed to encompass a variety of other techniques and advances, especially genome sequencing, the polymerase chain reaction and microarray technology. This has now developed still further, to the extent that many researchers no longer need sophisticated techniques to clone and identify specific genes. They can simply screen the genome sequence for the relevant gene, and (if needed) amplify it, using PCR. The changes we have made in this edition represent an attempt to reflect this development – especially by enhancing the treatment of bioinformatics. At the same time, we are conscious of the need to keep the book accessible to our target audience, which means not allowing it to expand much beyond its original size. Therefore, some topics have had to go. However, we have tried not to throw out the baby with the bathwater. Many of the older techniques still have a role to play – especially for those who are working with organisms whose genomes have not yet been sequenced. We have also retained a description of some techniques which, although now used less frequently, are either significant in understanding the development of the subject or play a useful role in understanding underlying concepts.

The main title of the book, *From Genes to Genomes*, is derived from the progress of this revolution. It signifies the move from the early focus on the isolation and identification of specific genes to the exciting advances that have been made possible by the sequencing of complete genomes. This has in turn spawned a whole new range of technologies (*post-genomics*) that are designed for genome-wide analysis of gene structure and expression. In this edition, we have strengthened this theme, by dealing first with methods that are applicable to individual genes before moving on to genome-wide concepts.

Dealing only with the techniques, without the applications, would be rather dry. Some of the applications are obvious – recombinant product formation, genetic diagnosis, transgenic plants and animals, and so on – and we have

attempted to introduce these to give you a flavour of the advances that continue to be made, but at the same time without burdening you with excessive detail. Equally important, possibly more so, are the contributions made to the advance of fundamental knowledge in areas such as developmental studies and molecular phylogeny.

The purpose of this book is to provide an introduction to the concepts and applications of this rapidly moving and fascinating field. In writing it, we had in mind its usefulness for undergraduate students in the biological and biomedical sciences (who we assume will have a basic grounding in molecular biology). However, it will also be relevant for many others, ranging from research workers and teachers who want to update their knowledge of related areas to anyone who would like to understand rather more of the background to current controversies about the applications of some of these techniques.

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