

Preface

There have been numerous advances made in many fields throughout the biosciences in recent years, with perhaps the most dramatic being those in our ability to investigate and define cellular processes at the molecular level. These insights have been largely the result of the development and application of powerful new techniques in molecular biology, in particular nucleic acid and protein methodologies.

The purpose of this book is to introduce the reader to a wide-ranging selection of those analytical and preparative techniques that are most frequently used by research workers in the field of molecular biology. Clearly, within the constraints of a single volume, we have had to be selective. However, all of the techniques described are core methods and in daily research use. We have aimed to describe both the theory behind, and the application of, the techniques described. For those who require detailed laboratory protocols, these can be found in the references cited in each chapter and in the laboratory protocol series *Methods in Molecular Biology*TM and *Methods in Molecular Medicine*TM published by Humana Press.

Molecular Biomethods Handbook begins with all the essential core nucleic acid techniques, such as the extraction and separation of nucleic acids, their detection and preliminary characterization, through to the application of gene probes and blotting techniques, each of which are described in separate chapters. The DNA technology theme is then developed to cover more complex areas of characterization, such as gene cloning and library production, mapping, and expression, as well as more applied fields, such as transgenesis, in vitro protein expression, mutagenesis, and DNA profiling. Within a number of larger, more generic chapters, a range of further specific techniques may be found. The latter part of the book similarly focuses on protein and related techniques. In this way we hope to provide the reader with information and background on many of the general concepts and specific techniques used in molecular biology at the present time. Although many chapters may stand alone in their own right, the majority are interlinked. Accordingly, these are cross-referenced in order to provide a coherent context in which a chapter may be read.

Molecular Biomethods Handbook should prove useful to undergraduate students (especially project students), postgraduate researchers, and all research scientists and technicians who wish to understand and use new techniques, but do not yet have the necessary background to set up specific techniques. In addition, it will be useful for all those wishing to update their knowledge of particular techniques. All chapters have been written by well-established research scientists who run their own research programs and who use the methods on a regular basis. In sum, then, our hope is that this book will prove a useful source of information on all the major molecular biotechniques in use today, as well as a valuable text for those already engaged in or just entering the field of molecular biology.

Ralph Rapley
John M. Walker