

Chromosome Analysis Protocols

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Edited by

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Preface

Chromosomes, as the genetic vehicles, provide the basic material for a large proportion of genetic investigations, from the construction of gene maps and models of chromosome organization, to the investigation of gene function and dysfunction. The study of chromosomes has developed in parallel with other aspects of molecular genetics, beginning with the first preparations of chromosomes from animal cells, through the development of banding techniques, which permitted the unequivocal identification of each chromosome in a karyotype, to the present analytical methods of molecular cytogenetics.

Although some of these techniques have been in use for many years, and can be learned relatively easily, most published scientific reports—as a result of pressure on space from editors, and the response to that pressure by authors—contain little in the way of technical detail, and thus are rarely adequate for a researcher hoping to find all the necessary information to embark on a method from scratch. A new user needs not only a detailed description of the methods, but also some help with problem solving and sorting out the difficulties encountered in handling any biological system. This was the requirement to which the series *Methods in Molecular Biology* is addressed, and *Chromosome Analysis Protocols* forms a part of this series.

Throughout the book, the primary emphasis is on the application of these methods to human material, since this is where the main thrust of molecular cytogenetics is currently directed. However, in most cases the techniques described are readily applicable to other organisms. Each chapter is written by an author who regularly uses the technique in his or her own laboratory. Most of them describe the very latest developments, but some, particularly the early ones, contain essential, classic methods, with only minor changes to improve their reliability. Each chapter starts with a description of the principle behind the methods to be described. The main thrust of the book,

however, is the description of the practical steps necessary to carry out the method successfully. The Methods section, therefore (with one exception), consists of a detailed, step-by-step description of a protocol, that, carefully followed, will result in the successful completion of the method. The Notes section complements the Methods section by indicating possible problem areas and their solutions and emphasizing points where particular care is needed.

The first third of the book describes methods for preparing chromosomes from a number of different cell types, and techniques for producing banded chromosomes and analyzing karyotypes. The remainder of the book focuses on the application of more specifically molecular techniques to those chromosome preparations, and descriptions of techniques for their detailed analysis.

The book is primarily intended for those who, although experienced in general laboratory procedures, have no previous experience of the specific techniques described here. It should appeal particularly to postgraduates, research workers, and those who are establishing new laboratories in the area of molecular cytogenetics.

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John R. Gosden

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