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## Preface to First Edition

This book is a unique source of information on the present state of the exciting field of molecular cytogenetics and how it can be applied in research and diagnostics. The basic techniques of fluorescence in situ hybridization and primed in situ hybridization (**PRINS**) are outlined, the multiple approaches and probe sets that are now available for these techniques are described, and applications of them are presented in 36 chapters by authors from ten different countries around the world. The book not only provides the reader with basic and background knowledge on the topic but also gives detailed protocols that show how molecular cytogenetics is currently performed by specialists in this field.

The *FISH Application Guide* initially provides an overview of the (historical) development of molecular cytogenetics, its basic procedures, the equipment required, and probe generation. The book then describes tips and tricks for making different tissues available for molecular cytogenetic studies. These are followed by chapters on various multicolor **FISH** probe sets, their availability, and their potential for use in combination with other approaches. The possible applications that are shown encompass the characterization of marker chromosomes, cryptic cytogenetic aberrations, and epigenetic changes in humans by interphase and metaphase cytogenetics, studies of nuclear architecture, as well as the application of molecular cytogenetics to zoology, botany, and microbiology. As comparative genomic hybridization (**CGH**), including array CGH, is currently indispensable for precisely characterizing minimal chromosomal aberrations, **CGH** and array-based chip techniques are reviewed, and protocols that describe how to perform them are also provided. Finally, an exclusive collection of Internet resources related to cytogenetics, molecular cytogenetics, and molecular genetics is given.

This up-to-date, comprehensive, and unique book is a valuable resource for lecturers and students, newcomers to the field of cytogenetics, as well as specialists in **FISH** techniques. Apart from cytogeneticists, molecular cytogeneticists, and human and clinical geneticists, this book is also of the greatest relevance to those working in the fields of reproduction medicine, oncology, hematology, pathology, cell biology, botany, zoology, evolutionary biology, and microbiology.

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Application Guide

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