

Preface

The *ACT Cytogenetics Laboratory Manual*, also known as the ACT Technical Manual, was first published by the Association of Cytogenetic Technologists in 1980. Its two editors, technologists Marilyn S. Arsham and Helen J. Lawce, were the driving force behind this work. They did much of the writing themselves and acquired the input of many practicing technologists who shared protocols, advice and troubleshooting strategies. Two additional chapters were published in 1984 and 1985 under the editorship of Gitta Wahrenburg.

In 1991 a second comprehensive edition, edited by Margaret J. Barch, was published with the goal of maintaining the philosophy and quality of content of the original while updating material, including an index, adding chapters on solid tumors, fragile sites and molecular cytogenetics, and producing a professionally published volume. The third edition, edited by Margaret J. Barch, Turid Knutsen, and Jack Spurbeck, was entitled the *AGT Cytogenetics Laboratory Manual* reflecting the change of ACT to AGT (the Association of Genetic Technologists) in 1996. The name change was officiated in order to incorporate the genetic technologies that complement the cytogenetic ones. The third edition also included an expanded treatment of molecular cytogenetics, including comparative genomic hybridization (CGH).

This fourth edition is completely updated and includes chapters on peripheral blood culture, continuous cell lines, prenatal diagnosis and culture, hematological and solid tumor malignancies, fragile sites, an expanded fluorescence in situ hybridization (FISH) chapter, molecular cytogenetics, a treatment of ISCN (International System for Human Cytogenomic Nomenclature), and a new approach to human chromosome identification. Other new topics to the fourth edition include safety, equipment maintenance, compliance, quality control, managerial tools, laboratory information software, laboratory mathematics, and even animal cytogenetics. Together, this constellation of chapters provides a comprehensive resource of both knowledge and skills that are essential to the daily operation of a cytogenetics laboratory.

Our goal has been to collect together in one volume a book which provides an in-depth treatment of the theoretical basis of the field, combined with a wealth of complementary protocols. This manual satisfies that goal by including an exhaustive survey of over 100 techniques for visualization and analysis of chromosome patterns in diagnosis and research. In most cases, protocols, along with their tips, hints, and processing detail, have been submitted by individuals who perform the test. Some procedures may have been edited in order to conform to the manual's general style. Important: Any new procedure, or changes to an existing one, must be properly validated by the performing laboratory before it can be used for clinical purposes.

We have designed this volume to be useful to students as well as to novice and experienced technologists. It is our hope that this new edition captures the vitality and fascination that the field of cytogenetics still holds as it continues to change.

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