

The Agt Cytogenetics Laboratory Manual

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cytogenetics is the study of chromosome morphology structure pathology function and behavior the field has evolved to embrace molecular cytogenetic changes now termed cytogenomics cytogeneticists utilize an assortment of procedures to investigate the full complement of chromosomes and or a targeted region within a specific chromosome in metaphase or interphase tools include routine analysis of g banded chromosomes specialized stains that address specific chromosomal structures and molecular probes such as fluorescence in situ hybridization fish and chromosome microarray analysis which

employ a variety of methods to highlight a region as small as a single specific genetic sequence under investigation the agt cytogenetics laboratory manual fourth edition offers a comprehensive description of the diagnostic tests offered by the clinical laboratory and explains the science behind them one of the most valuable assets is its rich compilation of laboratory tested protocols currently being used in leading laboratories along with practical advice for nearly every area of interest to cytogeneticists in addition to covering essential topics that have been the backbone of cytogenetics for over 60 years such as the basic components of a cell use of a microscope human tissue processing for cytogenetic analysis prenatal constitutional and neoplastic laboratory safety and the mechanisms behind chromosome rearrangement and aneuploidy this edition introduces new and expanded chapters by experts in the field some of these new topics include a unique collection of chromosome heteromorphisms clinical examples of genomic imprinting an example driven overview of chromosomal microarray mathematics specifically geared for the cytogeneticist usage of iscn s cytogenetic language to describe chromosome changes tips for laboratory management examples of laboratory information systems a collection of internet and library resources and a special chapter on animal chromosomes for the research and zoo cytogeneticist the range of topics is thus broad yet comprehensive offering the student a resource that teaches the procedures performed in the cytogenetics laboratory environment and the laboratory professional with a peer reviewed reference that explores the basis of each of these procedures this makes it a useful resource for researchers clinicians and lab professionals as well as students in a university or medical school setting

revised and expanded to cover advanced instrumentation techniques there are three separate chapters on peripheral blood culture continuous cell lines and prenatal diagnosis and culture and new chapters on solid tumours fragile sites and molecular cytogenetics

these days hardly a week goes by in the media without mention of a remarkable advancement in the field of genetics cytogenetics is a branch of genetics that is concerned with the study of the structure and function of the chromosomes and their role in heredity every individual inherits a pair of chromosomes from each of his parents each cell in our body has 46 chromosomes each chromosomes carry genetic information in the form of genes the genes within the chromosomes have a powerful impact on our health either directly through chromosomal or single gene disorders or by influencing our susceptibility to disease cytogenetic study is performed in order to diagnose certain genetic disorders such as congenital birth defects mental retardation growth and developmental delay defects of sexual development ambiguous genitalia congenital defects abnormal facial features infertility multiple miscarriages amenorrhea autism malignancies and hematological disorders early embryonic death and gene mutations among others these can be identified by chromosomal analysis and molecular cytogenetic techniques such as fluorescent in situ hybridization fish and microarray which have enormously expanded in recent years

first multi year cumulation covers six years 1965 70

earlier books on the handling of plant chromosomes have not included many of the innovations in cytological techniques for many important crops that have become available in recent years including information on associating genes with chromosomes the aim of this book is to compile all the plant cytogenetic techniques previously published in earlier books into a laboratory manual the first part of the book describes standard cytological techniques that are routinely used by students the second part covers methods used for specific crops for which common cytological methods do not work satisfactorily the third part discusses cytogenetic techniques cytology and genetics for physically locating genes on specific chromosomes this novel book will be highly useful to students teachers and researchers as it is a convenient and comprehensive reference for all plant cytogenetic techniques and protocols

this book is an up to date compilation of chromosome findings on bone and soft tissue tumors the book indicates the specificity of these changes and their relation to distinct pathologic entities it also emphasizes the use of cytogenetic findings as part of the diagnostic approach for these tumors and as a guide for molecular biologists searching for the specific gene involved each chapter contains a comprehensive summary of the pathology of the tumors particularly those in which cytogenetic findings have been published this book will be valuable to pathologists oncologists and surgeons dealing with tumors of bone and soft tissue

leading drosophilists describe in step by step detail all the essential techniques for studying drosophila chromosomes and suggest new avenues for scientific exploration the chapters emphasize specimen preparation from dissection to mounting and cover both polytene and mitotic meiotic chromosomes in depth each fully tested and readily reproducible protocol offers a background introduction equipment and reagent lists and tips on troubleshooting and avoiding pitfalls a cutting edge fish and immunolocalization technique will be important for discovering how dna sequence influences higher order chromosome architecture and ultimately gene expression

this is the first book to be devoted entirely to the application and development of flow techniques in cytogenetics it provides comprehensive information on the use of flow cytometry and sorting for chromosome classification and purification cytogenetics and molecular biologists will find this book an invaluable reference source key features practical details for the preparation and analysis of chromosomes using flow cytometry flow karyotyping for sensitive rapid analysis of chromosome normality and the detection of aberrant chromosomes flow sorting as a source of chromosome specific dna for gene mapping and recombinant dna libraries construction and current status of chromosome specific recombinant dna libraries

in addition to the traditional cytogenetics still used as the basic methodology for everyday clinical diagnosis new molecular cytogenetic techniques provide a useful basis for routine diagnosis fluorescence in situ hybridization fish has become a standard technique and comparative genomic hybridization cgh spectral karyotyping sky and multi color fish have shown their potential for diagnostic purposes following a section on tissue culture chromosome staining and basic information about karyotyping nomenclature and quality standards protocols of relevance for comprehensive cytogenetic diagnostics are presented

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