



Edward H. Hinchcliffe *Editor*

# Mitosis

Methods and Protocols

# Mitosis Methods And Protocols Methods In Molecular Biology

**Yi-Tong Ma**

## **Mitosis Methods And Protocols Methods In Molecular Biology:**

**Mitosis** Edward H. Hinchcliffe, 2021 This detailed volume collects a selection of key techniques for studying cell division representing multiple model systems and varied scales of approach Over the past 20 years a series of revolutions in experimental molecular biology including chimeric fluorescent protein expression multiple advanced modes of quantitative microscopy and array of small molecule inhibitors proteomic profiling and gene silencing manipulation analysis has advanced the mitosis field to a point where single cell biology not only allows for imaging localization studies but also for quantitative analysis and sequencing Written for the highly successful Methods in Molecular Biology series chapters include introductions to their respective topics lists of the necessary materials and reagents step by step readily reproducible laboratory protocols and tips on troubleshooting and avoiding known pitfalls Authoritative and practical Mitosis Methods and Protocols provides a repository of techniques and approaches for those working in the field as well as a working resource for those venturing into the study of mitosis for the first time

**Mitosis** Andrew D. McAinsh, 2009-06-29 Made possible by the advent of modern methodology and ideal for both experienced and novice scientists this volume provides an up to date collection of approaches that can be used to investigate how the mechanism of mitosis operates at the molecular level

**Mitotic Exit** Victor M. Bolanos-Garcia, 2024-11-29 This volume explores the latest approaches and techniques used to study mitotic exit in diverse model organisms The chapters in this book cover topics such as transgenic methods generation of RNAi sensitive cell lines gene overexpression in heterologous gene expression systems quantitative live cell imaging and FRET FLIM biochemical protocols for analyzing post translational modifications responsible for mitotic exit regulation and ways to promote mitosis arrest in disease associated conditions such as cancer Written in the highly successful Methods in Molecular Biology series format chapters include introductions to their respective topics lists of the necessary materials and reagents step by step readily reproducible laboratory protocols and tips on troubleshooting and avoiding known pitfalls Cutting edge and authoritative Mitotic Exit Methods and Protocols is a valuable resource for all researchers interested in learning more about this important and advancing field

**The Mitotic Spindle** Tomomi Kiyomitsu, 2024-12-01 This detailed volume presents methods for investigating mitotic spindle assembly chromosome segregation and cytokinesis Split into six parts the book examines advanced microscopes spatiotemporal manipulation of the spindle and target molecules quantitative live imaging screening centrosome manipulation and purification and spindle positioning in synthetic or complicated contexts Written for the highly successful Methods in Molecular Biology series chapters include introductions to their respective topics lists of the necessary materials and reagents step by step and readily reproducible laboratory protocols and tips on troubleshooting and avoiding known pitfalls Authoritative and up to date The Mitotic Spindle Methods and Protocols serves as an ideal guide for researchers seeking a better system level understanding of the mitotic spindle Chapters 4 12 17 and 19 are available open access under a Creative Commons Attribution 4.0 International License via link [springer.com](http://springer.com)

**Meiosis** Jesús A

Carballo,2024-08-10 This volume details protocols on meiosis covering the latest technological and methodological advances in this research field Chapters guide readers through methods on genomics biochemistry super resolution microscopy traditional genetics cytological methods as well as machine learning and in silico modelling Written in the highly successful Methods in Molecular Biology series format chapters include introductions to their respective topics lists of necessary materials and reagents step by step readily reproducible laboratory protocols and key tips on troubleshooting and avoiding known pitfalls Authoritative and cutting edge Meiosis Methods and Protocols aims to ensure successful results in further studies of this vital field

*Plant Cell Division* Marie-Cécile Caillaud,2022-11-11 This new edition explores innovative approaches and keystone methodologies reflecting the recent advances in the field of plant cell division that have enabled us to study this fascinating process in a quantitative manner at high resolution both in space and time using cell biology biochemistry and molecular biology After a review of the methods used to visualize the actin cytoskeleton during plant cell division the book focuses first on methodology to address mitosis progression as a part of the cell cycle It continues with sections on manipulation of cell division quantification of cell division patterning as well as imaging and quantifying plant cytokinesis Written for the highly successful Methods in Molecular Biology series chapters include introductions to their respective topics lists of the necessary materials and reagents step by step readily reproducible laboratory protocols and tips on troubleshooting and avoiding known pitfalls Authoritative and up to date Plant Cell Division Methods and Protocols Second Edition serves as an ideal guide for researchers attempting to visualize quantify and modify cell division during cell cycle progression

*Chromosome Analysis* Eisuke Gotoh,2022-09-06 This volume provides essential and fundamental protocols on manipulation chromosome Chapters details methods on the preparation of mitotic chromosome chromosome aberration micronucleus MN comet assay karyotyping Fluorescent in situ hybridization FISH premature chromosome condensation PCC immunohistochemistry IHC staining new generation sequencing technology and new chromosome concepts such as epigenetic and its cause of cancer are presented Written in the format of the highly successful Methods in Molecular Biology series each chapter includes an introduction to the topic lists necessary materials and reagents includes tips on troubleshooting and known pitfalls and step by step readily reproducible protocols Authoritative and cutting edge Chromosome Analysis Methods and Protocols aims to be a useful and practical guide to new researchers and experts looking to expand their knowledge

*Techniques for Work with Plant and Soil Nematodes* Roland N. Perry,David J. Hunt,Sergei A. Subbotin,2020-11-26 Plant parasitic and free living nematodes are increasingly important in relation to food security quarantine measures ecology including pollution studies and research on host parasite interactions Being mostly microscopic nematodes are challenging organisms for research Techniques for Work with Plant and Soil Nematodes introduces the basic techniques for laboratory and field work with plant parasitic and free living soil dwelling nematodes Written by an international team of experts this book is extensively illustrated and addresses both fundamental traditional techniques and

new methodologies The book covers areas that have become more widespread over recent years such as techniques used in diagnostic laboratories including computerized methods to count and identify nematodes Information on physiological assays electron microscopy techniques and basic information on current molecular methodologies and their various applications is also included

*The Mitotic Exit Network: Methods and Protocols* Fernando Monje-Casas, Ethel Queralt, 2018-11-23 This detailed book collects the main methodologies used for the analysis of the activity localization and regulation of the components of the Mitotic Exit Network MEN pathway during mitotic exit in *Saccharomyces cerevisiae* as well as for the evaluation of the roles of these proteins in other cellular processes such as the condensation of the rDNA the functionality of the mitotic checkpoints and cytokinesis Budding yeast serves as an ideal model system for dissecting the mechanisms that regulate cell cycle progression and providing new insights into the molecular basis of cell cycle control and thus into the origin of diseases that arise as a consequence of problems during cell division Therefore although this volume concentrates on *Saccharomyces cerevisiae* as a model it also details the implications that the research about the MEN have on our understanding of the mitotic exit process in higher eukaryotes Written for the highly successful Methods in Molecular Biology series chapters include introductions to their respective topics lists of the necessary materials and reagents step by step readily reproducible laboratory protocols and tips on troubleshooting and avoiding known pitfalls Authoritative and practical The Mitotic Exit Network Methods and Protocols will be a valuable reference for cellular and molecular biologists and biochemists as well as for all scientists interested in the study of the regulation of mitotic exit using budding yeast as a model organism

*Cell Cycle Control* Anna Castro, Benjamin Lacroix, 2024-02-23 This detailed volume collects techniques to study the highly regulated cell cycle process Beginning with chapters investigating these processes and assessing how cells respond when these complicated pathways are simplified by using synthetic biology and in vitro reconstitutions the book continues by exploring how cells sense and respond to environmental conditions different model systems and cellular types used to visualize cellular architecture during cell division as well as innovative single cell microscopy techniques to highlight the heterogeneity of the cell population with respect to cell cycle progression Written for the highly successful Methods in Molecular Biology series chapters include introductions to their respective topics lists of the necessary materials and reagents step by step and readily reproducible laboratory protocols and tips on troubleshooting and avoiding known pitfalls Authoritative and practical Cell Cycle Control Methods and Protocols serves as an ideal guide for researchers attempting to elucidate this vital area of cell biology

**Chromosome Analysis Protocols** John R. Gosden, 2008-02-02 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 Cell Cycle Oscillators

Amanda S. Coutts,Louise Weston,2015-08-09 This volume brings together a unique collection of protocols that cover standard novel and specialized techniques Cell Cycle Oscillators Methods and Protocols guides readers through recent progress in the field from both holistic and reductionist perspectives providing the latest developments in molecular biology techniques biochemistry and computational analysis used for studying oscillatory networks Written in the highly successful Methods in Molecular Biology series format chapters include introductions to their respective topics lists of the necessary materials and reagents step by step readily reproducible laboratory protocols and tips on troubleshooting and avoiding known pitfalls Authoritative and cutting edge Cell Cycle Oscillators Methods and Protocols will serve as an invaluable reference to gain further insight into the complex and incompletely understood processes that are involved in the cell cycle and its regulation by oscillatory networks Understanding Light Microscopy Jeremy Sanderson,2019-03-04 Introduces

readers to the enlightening world of the modern light microscope There have been rapid advances in science and technology over the last decade and the light microscope together with the information that it gives about the image has changed too Yet the fundamental principles of setting up and using a microscope rests upon unchanging physical principles that have been understood for years This informative practical full colour guide fills the gap between specialised edited texts on detailed research topics and introductory books which concentrate on an optical approach to the light microscope It also provides comprehensive coverage of confocal microscopy which has revolutionised light microscopy over the last few decades Written to help the reader understand set up and use the often very expensive and complex modern research light microscope properly Understanding Light Microscopy keeps mathematical formulae to a minimum containing and explaining them within boxes in the text Chapters provide in depth coverage of basic microscope optics and design ergonomics illumination diffraction and image formation reflected light polarised light and fluorescence microscopy deconvolution TIRF microscopy FRAP super resolution techniques biological and materials specimen preparation and more Gives a didactic introduction to the light microscope Encourages readers to use advanced fluorescence and confocal microscopes within a research institute or core microscopy facility Features full colour illustrations and workable practical protocols Understanding Light Microscopy is intended for any scientist who wishes to understand and use a modern light microscope It is also ideal as

supporting material for a formal taught course or for individual students to learn the key aspects of light microscopy through their own study    **Plant Meiosis** Wojciech P. Pawlowski,2013 Meiosis is one of the most critical processes in eukaryotes required for continuation of species and generation of new variation In plants meiotic recombination is by far the most important source of genetic variation In Plant Meiosis Methods and Protocols expert researchers in the field detail methods for molecular cytogenetics and chromosome analysis in plants These state of the art protocols allow studying the organization and behavior of the genetic material in a wide range of both model and crop species Written in the highly successful Methods in Molecular Biology series format chapters include introductions to their respective topics lists of the necessary materials and reagents step by step and readily reproducible laboratory protocols and key tips on troubleshooting and avoiding known pitfalls Authoritative and practical Plant Meiosis Methods and Protocols provides an extensive list of protocols developed and used in a number of laboratories at the cutting edge of meiosis and chromosome research

**Laboratory Techniques in Biochemistry and Molecular Biology** Thomas Spence Work,Elizabeth Work,1969

Molecular Regulation of Germ Cell Number and Fate in the Nematode C. Elegans Liana B. Lamont,2006    **Short**

**Protocols in Molecular Biology** Frederick M. Ausubel,2002 Recently expanded to 2 volumes Short Protocols in Molecular Biology Fifth Edition provides condensed descriptions of more than 700 methods compiled from Current Protocols in Molecular Biology Includes new chapters on chromatin assembly and analysis nucleic acid arrays generation and use of combinatorial libraries discovery and analysis of differentially expressed genes in single cells and cell populations The book is specifically designed to provide quick access to step by step instructions for the essential methods used in every major area of molecular biological research Short Protocols in Molecular Biology Fifth Edition is an authoritative and indispensable guide for all life scientists researchers and students at the graduate and advanced undergraduate level Expanded to 2 volumes

**Cell Cycle Control** Eishi Noguchi,Mariana C. Gadaleta,2014 Annotation A collection of new reviews and protocols from leading experts in cell cycle regulation Cell Cycle Control Mechanisms and Protocols Second Edition presents a comprehensive guide to recent technical and theoretical advancements in the field Beginning with the overviews of various cell cycle regulations this title presents the most current protocols and state of the art techniques used to generate latest findings in cell cycle regulation such as protocols to analyze cell cycle events and molecules Written in the successful Methods in Molecular Biology series format chapters include introductions to their respective topics lists of the necessary materials and reagents step by step readily reproducible protocols and notes on troubleshooting and avoiding known pitfalls Authoritative and easily accessible Cell Cycle Control Mechanisms and Protocols Second Edition will be a valuable resource for a wide audience ranging from the experienced cell cycle researchers looking for new approaches to the junior graduate students giving their first steps in cell cycle research    Forthcoming Books Rose Arny,2002    **Molecular Cytogenetics: Methods and Protocols** Camila Blair,2019-06-14 The branch of genetics which studies how chromosomes relate to cell

behavior and their behavior during mitosis and meiosis is known as cytogenetics Molecular cytogenetics is a field involving the combination of cytogenetics and molecular biology It uses several reagents and focuses on identifying and distinguishing normal and cancer causing cells It acts as a vital tool for the treatment of malignancies like brain tumors and hematological malignancies It includes techniques and methods like fluorescence in situ hybridization FISH and comparative genomic hybridization CGH This book is compiled in such a manner that it will provide in depth knowledge about the theory and practice of molecular cytogenetics From theories to research to practical applications case studies related to all contemporary topics of relevance to this field have been included in it This book aims to equip students and experts with the advanced topics and upcoming concepts in this area

## Unveiling the Magic of Words: A Review of "**Mitosis Methods And Protocols Methods In Molecular Biology**"

In a global defined by information and interconnectivity, the enchanting power of words has acquired unparalleled significance. Their power to kindle emotions, provoke contemplation, and ignite transformative change is truly awe-inspiring. Enter the realm of "**Mitosis Methods And Protocols Methods In Molecular Biology**," a mesmerizing literary masterpiece penned by way of a distinguished author, guiding readers on a profound journey to unravel the secrets and potential hidden within every word. In this critique, we shall delve into the book's central themes, examine its distinctive writing style, and assess its profound impact on the souls of its readers.

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