

Methods in Molecular Biology • 6

# Plant Cell and Tissue Culture

Edited by

**Jeffrey W. Pollard**

*Albert Einstein College of Medicine, Bronx, New York*

and

**John M. Walker**

*The Hatfield Polytechnic, Hatfield, Hertfordshire, UK*



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# Methods Of Molecular Biology Plant Cell And Tissue Culture Techniques Vol 6

**ML Morrison**



## **Methods Of Molecular Biology Plant Cell And Tissue Culture Techniques Vol 6:**

*Plant Cell and Tissue Culture* Indra K. Vasil, Trevor A. Thorpe, 2013-03-09 *Plant Cell and Tissue Culture* gives an exhaustive account of plant cell culture and genetic transformation including detailed chapters on all major field and plantation crops Part A presents a comprehensive coverage of all necessary laboratory techniques for the initiation nutrition maintenance and storage of plant cell and tissue cultures including discussions on these topics as well as on morphogenesis and regeneration meristem and shoot tip culture plant protoplasts mutant cell lines variation in tissue cultures isogenic lines fertilization control cryopreservation transformation and the production of secondary metabolites Part B then proceeds into detail on the specific in vitro culture of specific crops including cereals legumes vegetables potatoes other roots and tubers oilseeds temperate fruits tropical fruits plantation crops forest trees and ornamentals *Plant Cell and Tissue Culture* is and is likely to remain the laboratory manual of choice as well as a source of inspiration and a guide to all workers in the field

*Methods in Plant Cell Biology* David W. Galbraith, Hans J. Bohnert, Don P. Bourque, 1995 *Methods in Plant Cell Biology* provides in two volumes a comprehensive collection of analytical methods essential for researchers and students in the plant sciences Individual chapters written by experts in the field provide an introductory overview followed by a step by step technical description of the methods Key Features Written by experts many of whom have developed the individual methods described Contains most if not all the methods needed for modern research in plant cell biology Up to date and comprehensive Full references Allows quick access to relevant journal articles and to the sources of chemicals required for the procedures Selective concentration on higher plant methods allows for particular emphasis on those problems specific to plants

*Handbook of Molecular and Cellular Methods in Biology and Medicine* Leland J. Cseke, Ara Kirakosyan, Peter B. Kaufman, Margaret V. Westfall, 2016-04-19 Several milestones in biology have been achieved since the first publication of the *Handbook of Molecular and Cellular Methods in Biology and Medicine* This is true particularly with respect to genome level sequencing of higher eukaryotes the invention of DNA microarray technology advances in bioinformatics and the development of RNAi technology

**Handbook of Molecular and Cellular Methods in Biology and Medicine, Second Edition** Leland J. Cseke, Peter B. Kaufman, Gopi K. Podila, Chung-Jui Tsai, 2003-11-24 Since the publication of the best selling *Handbook of Molecular and Cellular Methods in Biology and Medicine* the field of biology has experienced several milestones Genome sequencing of higher eukaryotes has progressed at an unprecedented speed Starting with baker's yeast *Saccharomyces cerevisiae* organisms sequenced now include human *Homo sapiens* model crucifer *Arabidopsis thaliana* and rice *Oryza sativa* The invention of DNA microarray technology and advances in bioinformatics have generated vast amounts of genomic data Reflecting these revolutionary advances *Handbook of Molecular and Cellular Methods in Biology and Medicine Second Edition* documents conventional and modern approaches to tackle scientific research in the post genomics era Maintaining the step by step format that popularized the first edition each chapter provides the principles behind the

featured method a detailed description of each protocol applications of the protocol to different systems and references for further study Handbook of Molecular and Cellular Methods in Biology and Medicine Second Edition now includes New protocols in all chapters including alternative protocols In vitro transcription methods Analysis of DNA sequences New bioseparation techniques New chapters covering mRNA differential display Inhibition of gene expression In situ hybridization Localization of gene expression Combinatorial techniques Computational data mining methods applied to combinatorial chemistry libraries With this book at hand researchers teachers and students can understand and utilize the major techniques and methods currently employed in cellular and molecular biology      Experiments in Plant Tissue Culture John H. Dodds, Lorin W. Roberts, 1995-01-27 This new edition of a highly successful book has been completely revised and updated and features new illustrations and experiments      **Practical Fermentation Technology** Brian McNeil, Linda Harvey, 2008-04-15 A hands on book which begins by setting the context defining fermentation and the possible uses of fermenters and setting the scope for the book It then proceeds in a methodical manner to cover the equipment for research scale fermentation labs the different types of fermenters available their uses and modes of operation Once the lab is equipped the issues of fermentation media preservation strains and strain improvement strategies are documented along with the use of mathematical modelling as a method for prediction and control Broader questions such as scale up and scale down process monitoring and data logging and acquisition are discussed before separate chapters on animal cell culture systems and plant cell culture systems The final chapter documents the way forward for fermenters and how they can be used for non manufacturing purposes A glossary of terms at the back of the book along with a subject index will prove invaluable for quick reference Edited by academic consultants who have years of experience in fermentation technology each chapter is authored by experts from both industry and academia Industry authors come from GSK UK DSM Netherlands Eli Lilly USA and Broadley James UK USA      *The Methodology of Plant Genetic Manipulation: Criteria for Decision Making* Alan C. Cassells, Peter Jones, 2012-12-06 A range of novel techniques is available to the plant breeder today to complement classical breeding methods The new options are based on the integration of advances in plant cell biology with those in plant molecular biology Plant cell tissue and organ cultures provide efficient systems for transformation for the achievement of wide crosses and for the production of variation through spontaneous and induced mutation while permitting effective isolation of desired genotypes by in vitro selection This book presents a critical appraisal of the methodologies of plant genetic manipulation for advanced undergraduates postgraduates researchers and plant breeders and provides guidance on the choice of breeding options The latter depends on the breeding system of the crop the breeding objective and the tissue culture systems applicable to the target genotype s      **Guide to Information Sources in the Botanical Sciences** Elisabeth B. Davis, Diane Schmidt, 1995-12-15 Works cited in this useful survey are appropriate for students librarians and amateur and professional botanists These encompass the plant kingdom in all its divisions and aspects except those of

agriculture horticulture and gardening The majority of the annotations are for currently available in print or electronic reference works A comprehensive author title and a separate subject index make locating specific entries simple With materials ranging from those selected for the informed layperson to those for the specialist this new edition reflects the momentous transition from print to electronic information resources It is an appropriate purchase for public college university and professional libraries

Molecular Methods in Plant Pathology U. S. Singh, Rudra P. Singh, 2017-12-14

Molecular Methods in Plant Pathology covers methods in phytopathology at the molecular level including PCR techniques electron microscopy tissue culturing and the cloning of disease resistant genes Phytopathologists botanists horticulturists and anyone working in agriculture will find this a useful reference on biophysical biochemical biomolecular and biotechnological methods

**Somatic Embryogenesis in Woody Plants** S.M. Jain, P.K. Gupta, R.J. Newton, 2013-11-11 The quality of human life has been maintained and enhanced for generations by the use of trees and their products In recent years ever rising human population growth has put a tremendous pressure on trees and tree products growing awareness of the potential of previously unexploited tree resources and environmental pollution have both accelerated the development of new technologies for tree propagation breeding and improvement Biotechnology of trees may be the answer to solve the problems which can not be solved by conventional breeding methods The combination of biotechnology and conventional methods such as plant propagation and breeding may be a novel approach to improving and multiplying a large number of the trees and woody plants So far plant tissue culture technology has largely been exploited by commercial companies in propagation of ornamentals especially foliage house plants Generally tissue culture of woody plants has been recalcitrant However limited success has been achieved in tissue culture of angiosperm and gymnosperm woody plants A number of recent reports on somatic embryogenesis in woody plants such as Norway spruce *Picea abies* Loblolly pine *Pinus taeda* Sandalwood *Santalum album* Citrus mango *Mangifera indica* etc offer a ray of hope of an inexpensive clonal propagation for large scale production of plants or seedlings or somatic seedlings b protoplast work c cryopreservation d genetic transformation and e synthetic or artificial or manufactured seed production

**Genetic Preservation of Plant Cells in**

**Vitro** Brian Grout, 2012-12-06 The long term storage and maintenance of viable plant cells and organs is an area of active concern across the range of pure and applied plant sciences In academic government and commercial laboratories the extended storage of propagules of one sort or another with maximum protection of the genome from mutation and altered expression is often a very necessary activity that can draw heavily on resources and effort However preservation per se is typically not an activity in its own right but a facilitating technology that is part of a larger programme of work Consequently there are many laboratories that do not have the benefit of a specialist in storage technology and have to delegate the responsibility to individuals or teams who are faced with a daunting learning curve To maximise the chances of success in the shortest possible time and with minimum losses these researchers need sources of reference that are authoritative and

soundly based in practical experience      *In vitro Haploid Production in Higher Plants* S. Mohan Jain, S.K. Sopory, R.E. Veilleux, 2013-11-27 Since the beginning of agricultural production there has been a continuous effort to grow more and better quality food to feed ever increasing populations Both improved cultural practices and improved crop plants have allowed us to divert more human resources to non agricultural activities while still increasing agricultural production Malthusian population predictions continue to alarm agricultural researchers especially plant breeders to seek new technologies that will continue to allow us to produce more and better food by fewer people on less land Both improvement of existing cultivars and development of new high yielding cultivars are common goals for breeders of all crops In vitro haploid production is among the new technologies that show great promise toward the goal of increasing crop yields by making similar germplasm available for many crops that was used to implement one of the greatest plant breeding success stories of this century i.e the development of hybrid maize by crosses of inbred lines One of the main applications of anther culture has been to produce diploid homozygous pure lines in a single generation thus saving many generations of backcrossing to reach homozygosity by traditional means or in crops where self pollination is not possible Because doubled haploids are equivalent to inbred lines their value has been appreciated by plant breeders for decades The search for natural haploids and methods to induce them has been ongoing since the beginning of the 20th century      *A Colour Atlas of Plant Propagation and Conservation* Bryan Bowes, 1999-04-01 While scientific and socio political communities around the world are aware of the natural and economic importance of biodiversity we are faced with an ever increasing number of plant species under threat of extinction Conservation is thus a vital part of the plant scientist's work in the field in botanic gardens and in universities This colour      Plant Metabolites: Methods, Applications and Prospects Swapna Thacheril Sukumaran, Shiburaj Sugathan, Sabu Abdulhameed, 2020-11-28 Food security and the medicinal needs of billions of people around the world are pressing global issues and the biodiversity and sustainable utilization of plants is of great significance in this context Further ethnobotanical studies are vital in the discovery of new drugs from indigenous medicinal plants and plants with industrially important metabolites need to be cultivated to meet the growing market demand In addition the production of plant metabolites under in vitro conditions also has tremendous possibilities The totipotency of plant cells plays a valuable role in the sustainable utilization of plant resources through cell tissue and organ culture At the same time production can be enhanced using productive cell lines treatment with elicitors changing nutritional parameters and metabolic engineering This book provides state of the art information on biodiversity conservation ethnobotany various aspects of In vitro secondary metabolite production bioprospecting from various plant groups and drug discovery It also discusses methods of extracting and characterizing drug leads from plant sources      Biology and Breeding of Crucifers Surinder Kumar Gupta, 2016-04-19 Considerable interest has developed in recent years in crucifers and particularly in their wild relatives as they contain genetic material that may be utilized for further evolution of superior crop varieties through introgression and distant

hybridization Until now there has been no single volume that focuses exclusively on the biology and breeding Plant Tissue Culture: Theory and Practice S.S. Bhojwani, M.K. Razdan, 1996-11-08 Since the publication of the first edition in 1983 several new and exciting developments have taken place in the field of plant tissue culture which forms a major component of what is now called plant biotechnology The revised edition presents updated information on theoretical practical and applied aspects of plant tissue culture Each chapter has been thoroughly revised and as before is written in lucid language includes relevant media protocols and is profusely illustrated with self explanatory diagrams and original photographs This book includes three new chapters Variant selection Genetic Engineering and Production of Industrial Compounds and contains a complete bibliography and a glossary of terms commonly used in tissue culture literature This updated version proves to be an excellent text for undergraduate postgraduate students and teachers in various fields of plant sciences and a useful reference book for those interested in the application of any aspect of this aseptic technology **Plants from Test Tubes** Lydiane Kyte, John Kleyn, Holly Scoggins, 2025-04-08 Thirty years ago in vitro propagation was a new technique for producing plants and Lydiane Kyte's *Plants from Test Tubes* became the standard work on the topic The new fourth edition has been thoroughly revised and updated to reflect the many advances in science and technology including the five accepted sequential stages of micropropagation Ten new plants have been added This in turn has greatly expanded the already extensive bibliography Among the new topics that have been introduced or expanded on are embryo culture for breeding somaclonal variation anther culture somatic embryogenesis cryopreservation and genetic engineering More ornamental plant examples are given and many new illustrations provided including a chronology of discoveries in micropropagation

Animal Cell Culture: Principles and Practice Shalini Mani, Manisha Singh, Anil Kumar, 2023-01-31 This introductory guide provides novice researchers and lab students with a thorough step by step approach to standard animal cell culture techniques Coverage includes lab safety and best practices sterility management preparation ethical considerations and troubleshooting for common pain points This is an up to date indispensable handbook for early career researchers and students as well as established scientists in biotechnology cell and developmental biology pharmaceutical toxicology cytogenetics and more New and Future Developments in Catalysis Steven L Suib, 2013-07-17 *New and Future Developments in Catalysis* is a package of books that compile the latest ideas concerning alternate and renewable energy sources and the role that catalysis plays in converting new renewable feedstock into biofuels and biochemicals Both homogeneous and heterogeneous catalysts and catalytic processes will be discussed in a unified and comprehensive approach There will be extensive cross referencing within all volumes This volume covers all the biomass sources and gives detailed and in depth coverage of all current chemical catalytic conversion processes of biomass into liquid hydrocarbons to be further used as a feedstock for the production of not only biofuels but a large array of chemicals Offers an in depth coverage of all catalytic topics of current interest and outlines the future challenges and research areas A clear and visual

description of all parameters and conditions enables the reader to draw conclusions for a particular case Outline the catalytic processes applicable to energy generation and design of green processes      Somatic Hybridization in Crop Improvement II  
Toshiyuki Nagata,Y.P.S. Bajaj,2012-12-06 This richly illustrated volume describes how somatic hybrids can contribute to the improvement of crops It comprises 24 chapters dealing with interspecific and intergeneric somatic hybridization and cybridization providing valuable tools for plant breeders



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