Cloning Plants Using Tissue Culture

This book has been written to meet the needs of students for biotechnology courses at various levels of undergraduate and graduate studies. This book covers all the important aspects of plant tissue culture viz. nutrition media, micropropagation, organ culture, cell suspension culture, haploid culture, protoplast isolation and fusion, secondary metabolite production, somaclonal variation and cryopreservation. For good understanding of recombinant DNA technology, chapters on genetic material, organization of DNA in the genome and basic techniques involved in recombinant DNA technology have been added. Different aspects on rDNA technology covered gene cloning, isolation of plant genes, transposons and gene tagging, in vitro mutagenesis, PCR, molecular markers and marker assisted selection, gene transfer methods, chloroplast and mitochondrion DNA transformation, genomics and bioinformatics. Genomics covers functional and structural genomics, proteomics, metabolomics, sequencing status of different organisms and DNA chip technology. Application of biotechnology has been discussed as transgenics in crop improvement and impact of recombinant DNA technology mainly in relation to biotech crops.

"The purpose of this book is to provide a reference guide on principles and practices of cloning agricultural plants via in vitro techniques for scientists, students, commercial propagators, and other individuals who are interested in plant cell and tissue culture especially its application for cloning.Plant cell and tissue culture generated much excitement during 1970?s concerning the potential application of the technology for improving important agricultural crop plants. This originates from the demonstration of cellular totipotency, or the ability to regenerate whole plants from single cells, and the successful creation of hybrids by somatic cell fusion in some species. There are several areas of in vitro culture which have potential practical application. The most practical application is deemed as cloning or mass propagation of selected genotypes. This is evidenced by the large number of commercial firms engaged in propagating a variety of plants through tissue culture."--Provided by publisher.

Explains how to propagate plants using seeds, division, layering, cuttings, grafting and tissue culture, discusses special equipment and materials, and looks at fruits, nuts, shrubs, trees, and vines

This book discusses; somaclonal variation in crop improvement, the role of tissue culture in rapid clonal propagation and production of pathogen-free plant, protoplasts in crop improvement, cell selection and long-term high-frequency regeneration of cereals and legumes, agrobacteria-mediated gene transformation and vectors for gene cloning in plants, and plant frost injury and its management.

This book presents basic concepts, methodologies and applications of biotechnology for the conservation and propagation of aromatic, medicinal and other economic plants. It caters to the needs and challenges of researchers in plant biology, biotechnology, the medical sciences, pharmaceutical biotechnology and pharmacology areas by providing an accessible and cost-effective practical approach to micro-propagation and conservation strategies for plant species. It also includes illustrations describing a complete documentation of the results and research into particular plant species conducted by the authors over the past 5 years. Plant Biotechnology has been a subject of academic interest for a considerable time. In recent years, it has also become a useful tool in agriculture and medicine, as well as a popular area of biological research. Current economic growth is globally projected in a highly positive manner, but the challenges many countries face with regard to food, feed, malnutrition, infectious diseases, the newly identified life-style diseases, and energy shortages, all of which are worsened by an ever-deteriorating environment, continue to pull the growth digits back. The common thread that connects all of the above challenges is biotechnology, which could provide many answers. Molecular biology and biotechnology have now become an integral part of tissue culture research. The tremendous impact generated by genetic engineering and consequently of transgenics now allows us to manipulate plant genomes at will. There has indeed been a rapid development in this area with major successes in both developed and developing countries. The book introduces several new and exciting areas to researchers who are unfamiliar with plant biotechnology and also serves as a review of ongoing research and future directions for scholars. The book highlights numerous methods for in vitro propagation and utilization of techniques in raising transgenics to help readers reproduce the experiments discussed.

Progress in the field of plant cell and tissue culture has made this area of research one of the most dynamic and promising not only in plant physiology, cell biology and genetics but also in agriculture, forestry, horticulture and industry. Studies with plant cell cultures clearly have bearing upon a variety of problems as yet unsolved in basic and applied research. This was the compelling reason for assembling such a comprehensive source of information to stimulate students, teachers, and research workers. This book comprises 34 articles on regeneration of plants, vegetative propagation and cloning; haploids; cytology, cytogenetics and plant breeding; protoplasts, somatic hybridization and genetic engineering; plant pathology; secondary products and a chapter on isoenzymes, radiobiology, and cryobiology of plant cells. Particular attention has been paid to modern , fast-growing and fascinating disciplines - e.g. the induction of haploids, somatic hybridization and genetic manipulation by protoplast culture, which possess an enormous potential for plant improvement.

Biotechnology has come to a stage where, by replacing some of the age old practices of breeding, it can produce novel and improved plants and animals that can better serve human beings and their purposes. The techniques of cellular and subcellular engineering, such as gene splicing and recombinant DNA, cloning, hybridomas and monoclonal anti bodies, production of human insulin, protein engineering, industrial fermentation, artificial insemination, cryopreservation and ovum trans fer, plant tissue culture and somatic hybridization, nitrogen fixation, phytomass production for biofuels etc have advanced greatly in the past decade, due to the availability of better equipment and the consolida tion of knowledge. Product orientation has removed biotechnology from the area of pure academic interest to one of utility

where the final product is a spur to action. Businesses have started pouring money into projects, which has aided greatly in improving equipment, information exchange, and arousing the interest and imagination of the public. The common goal of science, industry and the public opens wide vistas and great hopes for biotechnology. The business of biotechnology addresses itself to issues of factory farming, technology transfer, joint ventures, international cooperation and to specific topics as well as the produc tion of diagnostic kits. Industry is particularly concerned with the phar maceutical field and microbial biotechnology from which profitable return§ can accrue. Commercial interests have led to better management practices and systematisation.

Regenerationb of plants, vegetative propagation and cloning; haploids; cyitology, cytogenetics and plant breeding; protoplasts, somatic hybridization and genetic engineering; tissue culture and plant pathology; cell culture and secondary products.

This comprehensive study guide covers the complete HSC Preliminary Se nior Science course and has been specifically created to maximise exam s uccess. This guide has been designed to meet all study needs, providing up-to-date information in an easy-to-use format. The sample HSC Exam has been updated for the new format. Excel HSC Preliminary Senior Science contains: an introductory section including how to use the book and an explanation of the new course helpfu l study and exam techniques comprehensive coverage of the entir e Preliminary and HSC courses hundreds of diagrams to aid under standing icons and boxes to highlight key concepts and assessme nt skills including laboratory and field work checklists of key terms end of chapter revision questions with fully explained a nswers a trial HSC-style exam with answers and explanations a glossary of key terms useful websites highlighted throu ghout

Plant biotechnology has created unprecedented opportunities for the manipulation of biological systems of plants. To understand biotechnology, it is essential to know the basic aspects of genes and their organization in the genome of plant cells. This text on the subject is aimed at students.

Includes a DVD Containing All Figures and Supplemental Images in PowerPoint This new edition of Plant Propagation Concepts and Laboratory Exercises presents a robust view of modern plant propagation practices such as vegetable grafting and micropropagation. Along with foundation knowledge in anatomy and plant physiology, the book takes a look into the future and how cutting edge research may impact plant propagation practices. The book emphasizes the principles of plant propagation applied in both temperate and tropical environments. In addition to presenting the fundamentals, the book features protocols and practices that students can apply in both laboratory and field experiences. The book shows readers how to choose the best methods for plant propagation including proper media and containers as well as performing techniques such as budding, cutting, layering, grafting, and cloning. It also discusses how to recognize and cope with various propagation challenges. Also included are concept chapters highlighting key information, laboratory exercises, anticipated laboratory results, stimulating questions, and a DVD containing all the figures in the book as well as some supplemental images.

Woody plants provide many challenges to the tissue culturist. Although there are many excellent tissue culture books and manuals available, these are generally strongly biased towards herbacious crops. Consequently, they often do not pay sufficient attention to the problems that specifically apply to in vitro culture of tree species. Culture of the latter often poses problems which are either absent or of lesser significance when culturing herbacious species. When trees in the field are used as explant source, the problems can be especially severe. For example, the physiological condition of the explants is difficult to control because of variation in weather and biotic factors. Furthermore, it is often difficult to obtain explants free of contaminants from field grown trees. Lack of genetic uniformity and maturation are additional problems one often has to deal with when culturing tree cells or tissues. These problems are emphasized in this text. In vitro culture of trees is not viewed in isolation. It is considered in conjunction with breeding, traditional cloning and other common tree improvement techniques. The text discusses theoretical as well as practical aspects of the in vitro culture of trees.

Plant Tissue CultureAPH PublishingPlant Tissue CultureBasic and AppliedUniversities Press

Innovation in research related to plant Biotechnology and Molecular Biology keeps an significant role in Applied Biological Science. With view to the importance of this study fruits, vegetable and ornamental plants were used as bioresources. Innovative technologies related to Plant Biotechnology and Molecular Biology are discussed. Application of different cell and tissue culture biotechnology (somatic embryogenesis, protoplast culture), DNA cloning, isolation and transformation, Protein and RNA isolations are described well in the case of Banana, pineapple, citrus fruits, broccoli Vegetables and ornamental plants (hibiscus sp.) using different growth regulators like BAP, NAA, IAA. IBA. The protocol presented well for the isolation of RNA from the pulp of ripening fruit using Agarose gel electrophoresis. SDS-PAGE analysis of different protein extracts has described from Hibiscus sp. Microprophagation from crown, sucker, leaf, root, shoot tip as meristemetic region showed a significant results which mentioned in this study. Transgenic plant mechanism or T-DNA mechanism in plant is described as latest innovation in Molecular Plant Biotechnology.

Plant biochemistry is the study of the chemistry of plants. Plant biochemists study the structure and function of cellular components and chemical reactions that taking place in plants. The tools and techniques of new biology have opened several new and exciting avenues in plant biochemistry. However, these have not been sufficiently tapped by plant scientists, in their rush for cloning, sequencing, tissue culture and transformation. Biochemistry is the study of chemical reactions taking place in living organisms, notably reactions of degradation of food substances which provide the energy required by organisms, and transformation of biosynthesis reactions leading to the formation of compounds needed by the cells. Medicinal plants are nature's hidden and to a large extent unexplored treasure. India is endowed with about 8000 species of medicinal plants. According to a recent estimate of the Planning Commission, Government of India, the potential for plant-based crude drugs is about Rs. 400 billion. Globally, the demand for medicinal plants and their derivatives is growing at a rate of 7-15%. This book provides students and researchers in the plant sciences with a concise, up-to-date account of the bio-chemical basis of the major metabolic processes in plants. This is a comprehensive, exclusive and exhaustive work on the subject. It is an asset for all researchers and scholars.

This fully revised fourth edition features background information and instructions for growing plants from cell structure and tissue culture and is written in terms that can be easily understood by both hobby botanists and experienced commercial growers.

Besides, recently molecular biology has assumed great importance with respect to plant biotechnology. The present book amalgamates all three aspects into one, practical applications of various techniques being the need of the hour. It discusses micropropagation studies on several crop plants, molecular basis of understanding various life processes including molecular basis of somatic embryogenesis and other physiological and biochemical processes having significant biotechnological applications. It also includes in vitro studies of some important plants like Aloe vera, Simmondsia chinensis, Anacyclus pyrethrum and Crataeva nurvala, Arachis hypogaea L., Phoenix dactylifera, Dendrocalamus asper, Asparagus adescendens Roxb., natural products of plant origin with their therapeutic potential and biotechnological production, genome analysis of crop plants with future applications in biotechnology etc.
The book is primarily designed for B.Sc. and M.Sc. students of Biotechnology, Botany, Plant Biotechnology, Plant Molecular Biology, Molecular Biology and Genetic Engineering as well as for those pursuing B.Tech. and M.Tech. in Biotechnology. It will also be of immense value to the research scholars and academics in the field. Though ample literature is available on this subject, still a textbook combining biotechnology and genetic engineering has always been in demand by the readers. Hence, with this objective, the authors have presented this compact yet comprehensive text to the students and the teaching fraternity, providing clear and concise understanding of the principles of biotechnology and genetic engineering. It has a special focus on tissue culture, protoplasm isolation and fusion, and transgenic plants in addition to the basic concepts and techniques of the subject. It gives sound knowledge of gene structure, manipulation and plant transformation vectors. KEY FEATURES • Combines knowledge of Plant Biotechnology and Genetic Engineering in a single volume. • Text interspersed with illustrative examples. • Graded questions and pedagogy, Multiple choice questions, Fill in the blanks, True-false, Short answer questions, Long answer questions and discussion problems in each chapter. • Clear, self-explanatory, and labelled diagrams. • Solutions to all MCQs in the respective chapters.
This book, first of this new two-volume set, provides an informative tour of the basics of biotechnology to recent advances in biotechnology. Knowledge of new and fresh approaches is a prerequisite to solving plant biological problems, and to this end, the editors have brought together a group of contributors who address the most recent techniques and their applications in plant biotechnology. The chapters discuss some recent techniques such as TILLING (Targeting Induced Local Lesions In Genomes), advances in molecular techniques to study diversity, protein purification, and methods and analysis in protein-protein interaction detection. The volume also covers molecular markers and QTL mapping, including four chapters that deal with different molecular markers, development of mapping populations, and association mapping for dissecting the genetic basis of complex traits in plants in sufficient detail. The knowledge of biotechnology techniques and their applications will be valuable for researchers and scientists as well as for the many students engaged in plant biotechnology studies.
The present book is divided into five sections. The first section deals with the methodology and bioresource generation, techniques related to genetic engineering, and gene transfer to the nuclear genome and chloroplast genome. The new techniques of genome profiling and gene silencing are also presented. The second section of the book deals with the classical aspect of plant biotechnology viz. tissue culture and micropropagation. Use of genetic engineering via Agrobacterium and direct transfer of DNA via particle bombardment to develop transformed plants in Artemesia, castor and orchids, and production of recombinant proteins in plant cells have been dealt with in the third section. The fourth section deals with the abiotic and biotic stress tolerance in plants. The basic biology of some of the stress responses, and designing plants for stress tolerance is discussed in this section. The fifth section deals with medicinal plants and alkaloid production.
Selection of superior individuals followed by clonal vegetative propagation is a very important strategy for plant improvement. Cloning via tissue culture can produce a population of an identical genotype without limits. A single specimen tree of Cladrastis kentukea and five different Cornus kousa cultivars were selected for tissue culture studies. These trees exhibited superior performance in horticultural trials, including disease resistance and drought tolerance, which are highly important to the green industry. Axillary buds from a single C. kentukea tree were initially cultured on either Woody Plant Medium (WPM) or Murashige and Skoog (MS) containing 0,1, 2, or 4 [mu]M 6-benzylaminopurine (BA). Cultures were transferred to fresh medium every four weeks. Elongated shoots were harvested after thirty-nine weeks and transferred to half-strength MS medium supplemented with following concentrations of IBA: 0, 3, 30, 100, and 300 [mu]M for three days then returned to half-strength MS without growth regulators. Explants exposed to 300 [mu]M of IBA produced significantly more roots (75%) compared to explants exposed to other treatments. Fifty- four and forty- six percent of the microshoots rooted when exposed to 100 and 30 [mu]M IBA, respectively. Only 4% of the microshoots rooted when exposed to 3 [mu]M IBA and none of the microshoots in the control treatment (0 IBA) rooted. Although 300 [mu]M treatment yielded the most rooted plantlets, there was significantly higher terminal meristem abortion compared to other treatments. There were no statistical differences between the numbers of roots viand total root length among all treatments. Additionally, all microshoots that rooted had lenticels, suggesting that presence of lenticel cambial activity can possibly predict rooting abilities of selected microshoots. Rooted microshoots were gradually acclimatized to non-sterile environment. Axillary and apical buds from five Cornus kousa cultivars ('Little Beauty', 'Samaritan', 'Heart Throb', 'Rosabella' and 'Christian Prince') were initially established on either WPM or one-half Woody Plant Medium/Broad Leaved Tree Medium (BW), amended with the following concentrations of 6-benzylaminopurine (BA): 0, 2, 4, and 8 [mu]M. After explants were transferred at four-week intervals for 28 weeks beginning in April, only microshoots of 'Samaritan', 'Heart Throb', and 'Rosabella', were harvested from proliferating cultures and placed on rooting media. 'Little Beauty' and 'Christian Prince' did not perform well in multiplication phase of tissue culture and were excluded from further studies. Rooting media contained WPM or BW supplemented with either 1- naphthaleneacetic acid (NAA),

indole-3-butyric acid (IBA), or indole-3-aceticacid (IAA) at the following concentrations: 0, 0.5, 1.5, 4.5, and 13.5 [mu]M. Six weeks following rooting experiment, preliminary data was collected and results indicated a total of nine plants rooted on both WPM and BW media supplemented with IBA, 17 plants rooted on media supplemented with NAA, and 14 plants rooted plants supplemented with IAA. NAA and IAA appeared to be better for root production on C. kousa cultivars microshoots than IBA. Moreover, both WPM and BW media supported rooting of C. kousa microshoots. However, WPM appears to support more root production compared to BW. A greater number of 'Samaritan' and 'Heart Throb' microshoots rooted on WPM amended with a wide range of NAA concentrations, whereas more 'Rosabella' microshoots rooted on BW medium amended with various concentrations of IAA. Since 'Rosabella' and 'Heart Throb' are very closely related and should have rooted with similar treatments, further research is needed to confirm this finding. Additionally, microshoots placed on either basal media supplemented with NAA produced significant amount of callus compared to microshoots exposed to other growth regulator treatments. The highest mean number of roots per rooted microshoot was recorded on 'Samaritan' when exposed to various NAA concentrations. In conclusion, the most and best rooting occurred with IBA treatments at lower concentrations, 0.5 and 1.5 [mu]M, whereas NAA and IAA treatments were inconclusive.

With its high-interest, magazine-like design and approach, this series teaches science in a way that appeals to teenagers. Digestible chunks of information, along with clear introductions and summaries of content in each chapter, encourage reluctant readers to approach, read, and learn important science content.

Plant Tissue Culture In One Form Or Another Has Become One Of The Most Promising Branches Of Plant Science. Arising From The Totipotency Of Plant Cells, It Now Occupies A Key Position In Plant Breeding, Plant Propagation And Plant Biotechnology.Plant Tissue Culture - Basic And Applied Brings To The Student Accessible, Up-To-Date Information On This Subject. Basic Knowledge Of Tissue Culture Methods Such As Isolation Of Suitable Tissues From The Mother Plant, Maintenance Of The Tissues Under In Vitro Condition In An Undifferentiated Or De-Differentiated Stage, Methods Of Genetic Engineering And Gene Transfer, Chromosomal Studies And The Handling Of In Vitro Micro Plants Are Described In Detail In This Book. Similarly, Application Aspects Of Micropropagation, Haploid Cell Culture, Protoplast Culture, Embryo Culture, Somatic Embryogenesis And Artificial Seeds Are Also Discussed.

Biotechnology, is the manipulation of biological organisms to make products that benefit human beings. Biotechnology contributes to such diverse areas as food production, waste disposal, mining and medicine. Plant biotechnology may be defined as the art, science and application of knowledge obtained from the study of life sciences to create technological improvements and change the genetics of plants in order to produce desired characteristics in plant species. This can be accomplished through many different techniques ranging from simply selecting plants with desirable characteristics for propagation, to more complex molecular techniques. Genetic engineering deals with synthesis of artificial gene, repair of gene, combining of DNA from two organism and manipulating the artificial gene together with the recombinant DNA for the improvement of microbes in plants as well as other living being. Genetic engineering opens a totally new dimension for bioprospecting. The search for new genes and their application is the primary objective of the biotech industry. Gene technology now enable humans to integrate revolutionary new properties in to cultivated plants through inter-specific or inter-generic gene transfer which was not possible through classical approach of crop improvement. This book covers all important aspects of practical utility in field of genetic manipulation by different areas of Plant Biotechnology Techniques.

For researchers and students, George’s books have become the standard works on in vitro plant propagation. For this, the third edition of the classic work, authors with specialist knowledge have been brought on board to cover the hugely expanded number of topics in the subject area. Scientific knowledge has expanded rapidly since the second edition and it would now be a daunting task for a single author to cover all aspects adequately. However, this edition still maintains the integration that was characteristic of the previous editions. The first volume of the new edition highlights the scientific background of in vitro propagation. The second volume covers the practice of micropropagation and describes its various applications.

Biotechnology revolutionized traditional plant breeding programs. This rapid change produced new discussions on techniques and opportunities for commerce, as well as a fear of the unknown. Plant Development and Biotechnology addresses the major issues of the field, with chapters on broad topics written by specialists. The book applies an informal style that addresses the major aspects of development and biotechnology with minimal references, without sacrificing information or accuracy. Divided into five primary parts, this volume explores how the field emerged from its early theoretical base to the technical discipline of today. It also covers progress being made with genetically engineered plants, providing a snapshot of the field's controversial present. Part III discusses methods for preparing media, creating solutions and dilutions, and accomplishing sterile culture work. It investigates common methods for visualizing and documenting studies, and quantifying responses of tissue culture in research. Part IV delivers the essential foundation of plant tissue culture, introducing the three types of commonly used culture regeneration systems. Part V integrates propagation techniques with other methodologies for the modification and manipulation of germplasm. Part VI concludes with special sections. Subjects include in vitro plant pathology, recent research into genetic and phenotypic variation, the mechanics of commercial plant production, and the importance of clean cultures and problems associated with maintaining in vitro cultures. The final chapter analyzes entrepreneurship in the field and outlines the do's and don'ts to consider when launching an enterprise.

This Success Revision Guide offers accessible content to help students manage their revision and prepare for the exam efficiently. The content is broken into manageable sections and advice is offered to help build students' confidence. Exam tips and techniques are provided to support students throughout the revision process.

Summarizes the latest scientific findings and methods in molecular biology, genetic engineering, and tissue culture, applied to agriculture. Emphasis is on cell and tissue culture, genetic transformation, and regeneration of transgenic plants. Contains chapters on the plant genome, plant genetic engineering, gene transfer systems for plants, and plant tissue culture, plus study outlines and questions. For undergraduate and graduate students. Annotation copyrighted by Book News, Inc., Portland, OR.

This one-of-a-kind publication focuses on the improvement of the feed value of tall fescue and further extension of its adaptability under various environmental stresses. This fascinating work comprehensively explains cell and tissue culture methods which are used to establish somatic cell cultures, select among cells, and regenerate plants with the genetic characteristics of the selected cells. This up-to-date volume includes information on cultural haploid plants from immature pollen grains. It also evaluates the plants under various environmental stresses to identify genotypes with superior characteristics. This book also features research data on somatic tissue culture methods and doubled haploids. Biotechnology in Tall Fescue Improvement is an indispensable resource and useful text for all those involved with agronomy, plant physiology, horticultural science, crop science, and botany.

A number of interdisciplinary fields related to Plant Cell Biotechnology are discussed. The two main directions are: Plant cell culture in agricultural applications for the improvement of crops and industrial applications in the production of secondary metabolites. A number of areas such as physiological and biochemical aspects of autotrophic cells, gene characterization in higher plants, transformation of plant cells, genetic stability in plant cell cultures, somatic hybridization and somatic embryogenesis are treated. Recent knowledge on somaclonal and

gametoclonal variation as well as on the obtainment of protoplasts and their use for the isolation and culture of heterocaryons as tools for plant breeding are considered. Furthermore, the knowledge on biomass production in fermentor conditions and the role of immobilization for increased production and scale-up of plant cells are discussed.

This symposium is the third in a series featuring the propaga tion of higher plants through tissue culture. The first of these symposia, entitled "A Bridge Between Research and Application," was held at the University in 1978 and was published by the Technical Information Center, Department of Energy. The second symposium, on "Emerging Technologies and Strategies," was held in 1980 and pub lished as a special issue of Environmental and Experimental Botany. One of the aims of these symposia was to examine the current state of-the-art in tissue culture technology and to relate this state of technology to practical, applied, and commercial interests. Thus, the third of this series on development and variation focused on embryogenesis in culture: how to recognize it, factors which affect embryogenesis, use of embryogenic systems, etc.; and variability from culture. A special session on woody species again emphasized somatic embryogenesis as a means of rapid propagation. This volume emphasizes tissue culture of forest trees. All of these areas, we feel, are breakthrough areas in which significant progress is expected in the next few years.

Biotechnology Is Any Technological Application That Uses Biological Systems, Living Organisms Or Derivatives Thereof, To Make Or Modify Products Or Processes For Specific Use. The Modern Biotechnology Can Have A Dramatic Effect On The World Economy And Society. Biotechnology Applications Of Particular Interest Include Cell Culture, Genomics, Molecular Marker Assisted Breeding, Cloning, Bioprocessing And Diagnostic Testing, Gene Technology Etc. Developments And Researches In The Application Of Biotechnology Are Underway In Areas As Diverse As Pharmaceuticals, Diagnostics, Textile, Aquaculture, Forestry, Chemicals, Household Products, Environmental Cleanup, Food Processing And Forensics. The Present Book Biotechnology : Tissue Culture To Proteomics Provides An Authoritative Review Account Of Many Aspects Of Current Interest And Progress In The Field Of Biotechnology That Has Been Made In The Recent Past. Major Section Includes Articles On Plant Tissue Culture And Application Of Biotechnology In Agriculture And Medicine. Topic On Role Of Biotechnology In Plant Tissue Culture; In Vitro Tissue Culture Studies In Various Leguminous Plants; Regeneration And Transformation In Pigeonpea And Legumes In General; In Vitro Micropropagation Of Medicinal Plants; In Vitro Propagation Of Some Medicinal Plants As A Biotechnological Tool For Conservation; Biotechnological Applications In Improvement Of Trees; In Vitro Clonal Propagation Through Mature Nodal Segments Of Gymnema Sylvestre And Development Of Transgenic Plants Resistant To Fungal Diseases Provide Necessary Information Using Tissue Culture Technique. Topics Covering Information On Biotechnology In Astrobiology; Edible Vaccines; Bioinformatic Tools For Sequence Analysis; Lipidomics; Proteomics Have Been Specially Included To Project Their Role In 21St Century. This Book Will Be Useful To Biotechnologists, Biologists, Agriculture Scientists, Researchers, Teachers And Students Of Plant Sciences.