Pcr Troubleshooting Optimization The Essential Guide

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Microbial Food Safety - Omar A. Oyarzabal 2011-12-03
In this book, some of the most qualified scientists review different food safety topics, ranging from emerging and reemerging foodborne pathogens, food regulations in the USA, food risk analysis and the most important foodborne pathogens based on food commodities. This book provides the reader with the necessary knowledge to understand some of the complexities of food safety. However, anybody with basic knowledge in microbiology will find in this book additional

information related to a variety of food safety topics.

Diagnostic Molecular Pathology - William B. Coleman 2016-10-05 Diagnostic Molecular Pathology: A Guide to Applied Molecular Testing is organized around disease types (genetic disease, infectious disease, neoplastic disease, among others). In each section, the authors provide background on disease mechanisms and describe how laboratory testing is built on knowledge of these mechanisms. Sections are dedicated to general methodologies employed in testing (to convey the concepts reflected in the methods), and specific description of how these methods can be applied and are applied to specific diseases are described. The book does not present molecular methods in isolation, but considers how other evidence (symptoms, radiology or other imaging, or other clinical tests) is used to guide the selection of molecular tests or how these other data are used in conjunction with molecular tests to make diagnoses (or otherwise contribute to clinical workup). In addition, final chapters look to the future (new technologies, new approaches) of applied molecular pathology and how discovery-based research will yield new and useful biomarkers and tests. Diagnostic Molecular Pathology: A Guide to Applied Molecular Testing contains exercises to test readers on their understanding of how molecular diagnostic tests are utilized and the value of the information that can be obtained in the context of the patient workup. Readers are directed to an ancillary website that contains supplementary materials in the form of exercises where decision trees can be employed to simulate actual clinical decisions. Focuses on the menu of molecular diagnostic tests available in modern molecular pathology or clinical laboratories that can be applied to disease

detection, diagnosis, and classification in the clinical workup of a patient Explains how molecular tests are utilized to guide the treatment of patients in personalized medicine (guided therapies) and for prognostication of disease Features an ancillary website with self-testing exercises where decision trees can be employed to simulate actual clinical decisions Highlights new technologies and approaches of applied molecular pathology and how discovery-based research will yield new and useful biomarkers and tests

Secure and Trustworthy Cyberphysical Microfluidic Biochips - Jack Tang 2019-05-28

This book describes novel hardware security and microfluidic biochip design methodologies to protect against tampering attacks in cyberphysical microfluidic biochips (CPMBs). It also provides a general overview of this nascent area of research, which will prove to be a vital resource for practitioners in the field.This book shows how hardware-based countermeasures and design innovations can be a simple and effective last line of defense, demonstrating that it is no longer justifiable to ignore security and trust in the design phase of biochips.

PCR Protocols - Michael A. Innis 2012-12-02

The correct procedures you need for frustration-free PCR methods and applications are contained in this complete, step-by-step, clearly written, inexpensive manual. Avoid contamination--with specific instructions on setting up your lab Avoid cumbersome molecular biological techniques Discover new applications

PCR Guru - Ayaz Najafov 2016-11-28

PCR Guru: An Ultimate Benchtop Reference for Molecular Biologists is provides researchers in molecular biology

with a handy reference for approaching and solving challenging problems associated with PCR setup and optimization. As a laboratory guide, it emphasizes the technical aspects of employing PCR as a tool in molecular biology laboratories. The book covers the history of PCR and the basic science underlying it. It then discusses PCR at the bench level, starting with detailed description and tips on primer design, and continuing with the standard protocols used to perform PCR. Provides troubleshooting tips for various types of modifications of standard protocols Contains unique “Good Practices and Tips that are indispensable for the beginner and expert alike Features “Special Cases with applications of PCR, optimization, and troubleshooting Includes detailed appendices with tables, figures, and key protocols Organized as a systematic, concentrated resource to save time when addressing a PCR problem

Principles and Technical Aspects of PCR Amplification - Elizabeth van Pelt-Verkuil 2008-03-14

Kary Mullis was awarded a Nobel Prize for inventing the PCR technique more than a decade ago in 1993. Since its "discovery", multiple adaptations and variations of the standard PCR technique have been described. This publication aims to provide the reader with a guide to the standard PCR technique and its many available variants, with particular emphasis being placed on the role of these PCR techniques in the clinical diagnostic laboratory (the central theme of this book).

Molecular Biology Problem Solver - Alan S. Gerstein 2004-04-07

Most research in the life sciences involves a core set ofmolecular-based equipment and methods, for which there is noshortage of step-by-step protocols. Nonetheless, there remains

anexceedingly high number of inquiries placed to commercial technicalsupport groups, especially regarding problems. Molecular Biology Problem Solver: A LaboratoryGuide asks the reader to consider crucial questions, suchas: Have you selected the most appropriate research strategy? Have you identified the issues critical to your successfulapplication of a technique? Are you familiar with the limitations of a giventechnique? When should common procedural rules of thumb not beapplied? What strategies could you apply to resolve a problem? A unique question-based format reviews common assumptions andlaboratory practices, with the aim of offering a firm understandingof how techniques and procedures work, as well as how to avoidproblems. Some major issues explored by the book's expertcontributors include: Working safely with biological samples and radioactivematerials DNA and RNA purification PCR Protein and nucleid acid hybridization Prokaryotic and eukaryotic expression systems Properly using and maintaining laboratory equipment

Insect Molecular Genetics - Marjorie A. Hoy 2013-04-09

Insect Molecular Genetics, Third Edition, summarizes and synthesizes two rather disparate disciplines—entomology and molecular genetics. This volume provides an introduction to the techniques and literature of molecular genetics; defines terminology; and reviews concepts, principles, and applications of these powerful tools. The world of insect molecular genetics, once dominated by Drosophila, has become much more diverse, especially with the sequencing of multiple arthropod genomes (from spider mites to mosquitoes). This introduction includes discussion of honey bees,

mosquitoes, flour beetles, silk moths, fruit flies, aphids, house flies, kissing bugs, cicadas, butterflies, tsetse flies and armyworms. This book serves as both a foundational text and a review of a rapidly growing literature. With fully revised and updated chapters, the third edition will be a valuable addition to the personal libraries of entomologists, geneticists, and molecular biologists. Up-to-date references to important review articles, websites, and seminal citations in the disciplines Well crafted and instructive illustrations integral to explaining the techniques of molecular genetics Glossary of terms to help beginners learn the vocabulary of molecular biology

Real-time PCR - Kirstin Edwards 2004

This essential manual presents a comprehensive guide to the most appropriate and up-to-date technologies and applications as well as providing an overview of the theory of this important technique. Written by recognized experts in the field this timely and authoritative volume is an essential requirement for all laboratories using PCR. Topics covered include: Real-time PCR instruments and probe chemistries, set-up, controls and validation, quantitative real-time PCR, analysis of mRNA expression, mutation detection, NASBA, application in clinical microbiology and diagnosis of infection.

PCR Strategies - Michael A. Innis 1995-07-06

PCR Strategies expands and updates the landmark volume PCR Protocols. It is a companion laboratory manual that provides a completely new set of up-to-date strategies and protocols for getting the most from PCR. The editors have organized the book into four sections, focusing on principles, analyses, research applications, and alternative

strategies for a wide variety of basic and clinical needs. If you own PCR Protocols, you will want PCR Strategies. If you don't own PCR Protocols, you will want to buy both! Concepts explained Methods detailed Trouble-shooting emphasized Novel applications highlighted Key concepts for PCR Analysis of PCR products Research applications Alternative amplification strategies

PCR: Methods Express - Simon Hughes 2007-05-01

PCR is the most widely used technique in molecular biology. New PCR variants offering substantial benefits to existing protocols appear on a frequent basis. PCR: Methods Express describes the very latest PCR-based methodologies and approaches to provide the most up-to-date practical advice on how to tackle a broad range of biological problems including: *real time qRT-PCR *rapid generation of gene targeting constructs *PCR multiplexes *PCR-based mutagenesis *identification of microdeletions and microduplications *DNA methylation analysis *forensic genetic DNA typing *genotyping *identification of mutations in single cells *whole genome amplification *diagnosis of infectious diseases *inverse PCR-based RFLP This book is a comprehensive research guide; every chapter discusses the merits and limitations of the available approaches and then provides fully-proven protocols with hints and tips for success. PCR: Methods Express is an essential laboratory manual for researchers in all life science fields and at all levels, from postgraduate student to principal investigator.

Dorfman and Czerniak's Bone Tumors E-Book - Bogdan Czerniak 2015-08-19

The second edition of Dorfman and Czerniak's Bone Tumors brings together the latest data

available on bone tumor pathology, making it the most comprehensive and encyclopedic reference on the epidemiology, clinical, pathologic, and molecular aspects of bone tumors. Now offered in full color and featuring updated imaging throughout, this one-of-a-kind resource provides a highly visual review of every disorder — from the common to the rare. Features comprehensive coverage of bone tumor pathology based on pathologic and clinical data on 11,500 benign and malignant bone tumors from patients treated at the MD Anderson Cancer Center. High-quality full-color images located throughout the text. Completely up-to-date molecular and genetic information is based on the most current genomic databases. Four brand-new chapters cover Radiographic Imaging of Bone Tumors; Hematopoetic Tumors; Neural Tumors; and Metastic Tumors of Bone. Includes information on molecular and genetic aspects of bone tumors from the UCSC Genome Browser, the Catologue of Somatic Mutations in Cancer, and the GeneCards Database of human genes. Features comprehensive data from nearly 30,000 benign and malignant primary bone tumors and tumor-like lesions from different sources, including over 8,400 malignant bone tumors from the National Cancer Institute's Surveillance, Epidemiology and End Result project. Provides an enhanced visual understanding with updated radiographic imaging and new full-color, high-quality photomicrographs. Updated Molecular and Epidemiologic diagrams added to all new chapters.

Animal Biotechnology - Ashish Verma 2013-11-04

Animal Biotechnology introduces applications of animal biotechnology and implications for human health and welfare. It begins with an introduction to

animal cell cultures and genome sequencing analysis and provides readers with a review of available cell and molecular tools. Topics here include the use of transgenic animal models, tissue engineering, nanobiotechnology, and proteomics. The book then delivers in-depth examples of applications in human health and prospects for the future, including cytogenetics and molecular genetics, xenografts, and treatment of HIV and cancers. All this is complemented by a discussion of the ethical and safety considerations in the field. Animal biotechnology is a broad field encompassing the polarities of fundamental and applied research, including molecular modeling, gene manipulation, development of diagnostics and vaccines, and manipulation of tissue. Given the tools that are currently available and the translational potential for these studies, animal biotechnology has become one of the most essential subjects for those studying life sciences. Highlights the latest biomedical applications of genetically modified and cloned animals with a focus on cancer and infectious diseases Provides firsthand accounts of the use of biotechnology tools, including molecular markers, stem cells, and tissue engineering

Gene Quantification - Francois Ferre 2012-12-06

Geneticists and molecular biologists have been interested in quantifying genes and their products for many years and for various reasons (Bishop, 1974). Early molecular methods were based on molecular hybridization, and were devised shortly after Marmur and Doty (1961) first showed that denaturation of the double helix could be reversed - that the process of molecular reassociation was exquisitely sequence dependent. Gillespie and Spiegelman (1965) developed a way of using the method to titrate the number of copies of a

probe within a target sequence in which the target sequence was fixed to a membrane support prior to hybridization with the probe - typically a RNA. Thus, this was a precursor to many of the methods still in use, and indeed under development, today. Early examples of the application of these methods included the measurement of the copy numbers in gene families such as the ribosomal genes and the immunoglo bulin family. Amplification of genes in tumors and in response to drug treatment was discovered by this method. In the same period, methods were invented for estimating gene num bers based on the kinetics of the reassociation process - the so-called Cot analysis. This method, which exploits the dependence of the rate of reassociation on the concentration of the two strands, revealed the presence of repeated sequences in the DNA of higher eukaryotes (Britten and Kohne, 1968). An adaptation to RNA, Rot analysis (Melli and Bishop, 1969), was used to measure the abundance of RNAs in a mixed population.

RNA Methodologies - Robert E. Farrell, Jr. 2010-07-22

This laboratory guide represents a growing collection of tried, tested and optimized laboratory protocols for the isolation and characterization of eukaryotic RNA, with lesser emphasis on the characterization of prokaryotic transcripts. Collectively the chapters work together to embellish the RNA story, each presenting clear take-home lessons, liberally incorporating flow charts, tables and graphs to facilitate learning and assist in the planning and implementation phases of a project. RNA Methodologies, 3rd edition includes approximately 30% new material, including chapters on the more recent technologies of RNA interference including: RNAi;

Microarrays; Bioinformatics. It also includes new sections on: new and improved RT-PCR techniques; innovative 5' and 3' RACE techniques; subtractive PCR methods; methods for improving cDNA synthesis. * Author is a well-recognized expert in the field of RNA experimentation and founded Exon-Intron, a well-known biotechnology educational workshop center * Includes classic and contemporary techniques * Incorporates flow charts, tables, and graphs to facilitate learning and assist in the planning phases of projects

A Guide to Forensic DNA Profiling - Scott Bader 2016-03-08 The increasingly arcane world of DNA profiling demands that those needing to understand at least some of it must find a source of reliable and understandable information. Combining material from the successful Wiley Encyclopedia of Forensic Science with newly commissioned and updated material, the Editors have used their own extensive experience in criminal casework across the world to compile an informative guide that will provide knowledge and thought-provoking articles of interest to anyone involved or interested in the use of DNA in the forensic context. Following extensive introductory chapters covering forensic DNA profiling and forensic genetics, this comprehensive volume presents a substantial breadth of material covering: Fundamental material – including sources of DNA, validation, and accreditation Analysis and interpretation – including, extraction, quantification, amplification and interpretation of electropherograms (epgs) Evaluation – including mixtures, low template, and transfer Applications – databases, paternity and kinship, mitochondrial-DNA, wildlife DNA, single-nucleotide

polymorphism, phenotyping and familial searching Court - report writing, discovery, cross examination, and current controversies With contributions from leading experts across the whole gamut of forensic science, this volume is intended to be authoritative but not authoritarian, informative but comprehensible, and comprehensive but concise. It will prove to be a valuable addition, and useful resource, for scientists, lawyers, teachers, criminologists, and judges.

PCR Protocols - John M. S. Bartlett 2008-02-03

In this new edition, the editors have thoroughly updated and dramatically expanded the number of protocols to take advantage of the newest technologies used in all branches of research and clinical medicine today. These proven methods include real time PCR, SNP analysis, nested PCR, direct PCR, and long range PCR. Among the highlights are chapters on genome profiling by SAGE, differential display and chip technologies, the amplification of whole genome DNA by random degenerate oligonucleotide PCR, and the refinement of PCR methods for the analysis of fragmented DNA from fixed tissues. Each fully tested protocol is described in step-by-step detail by an established expert in the field and includes a background introduction outlining the principle behind the technique, equipment and reagent lists, tips on trouble shooting and avoiding known pitfalls, and, where needed, a discussion of the interpretation and use of results.

PCR Technology - Henry Erlich 2015-12-31

This is an introduction to the methods and applications of polymerase chain reaction (PCR) technology, a technology developed by Erlich's group at Cetus and Cetus, and is expected to be used in all biology

laboratories worldwide within the next few years.

Western Blotting Guru - Ayaz Najafov 2017-07-07

Western Blotting Guru provides researchers in molecular biology with a handy reference for approaching and solving challenging problems associated with immunoblotting setup and optimization. As a laboratory guide, it emphasizes the technical aspects of efficiently employing immunoblotting as a tool in molecular biology laboratories. The book covers the basic science underlying immunoblotting and detailed description of the method parameters, followed by good benchtop practices, tips and tricks for obtaining high-quality data and a detailed troubleshooting guide addressing a variety of problem types. Provides a benchtop reference that every molecular biologists will use to design, optimize, troubleshoot and analyze their immunoblotting experiments Contains unique good practices and tips that are indispensable for the beginner and expert alike Features special cases with applications of immunoblotting optimization Includes detailed appendices with tables, figures and key protocols Provides troubleshooting tips for various types of modifications of standard protocols Organized as a systematic, concentrated resource to save time when addressing an immunoblotting problem

The Nucleic Acid Protocols Handbook - Ralph Rapley 2008-06-29

A comprehensive treasury of all the key molecular biology methods-ranging from DNA extraction to gene localization in situ-needed to function effectively in the modern laboratory. Each of the 120 highly successful techniques follows the format of the much acclaimed Methods in Molecular BiologyOao series, providing an introduction to the scientific basis

of each technique, a complete listing of all the necessary materials and reagents, and clear step-by-step instruction to permit error-free execution. Included for each technique are notes about pitfalls to avoid, troubleshooting tips, alternate methods, and explanations of the reasons for certain steps-all key elements contributing significantly to success or failure in the lab. The Nucleic Acid Protocols Handbook constitutes today's most comprehensive collection of all the key classic and cutting-edge techniques for the successful isolation, analysis, and manipulation of nucleic acids by both experienced researchers and those new to the field."

PCR Protocols in Molecular Toxicology - John P. Vanden Heuvel 2019-05-07

Molecular toxicology is an emerging discipline that utilizes molecular and cell biology to understand how drugs and chemicals result in their unwanted effects. PCR Protocols in Molecular Toxicology is a practical guide to the use of polymerase chain reaction (PCR) to help examine, on a molecular and cellular level, how toxic responses are manifested. It offers a basic understanding of PCR and its optimization, as well as describing specific, high-impact areas of molecular toxicology and recent advances. The following techniques are described in detail: Quantitative reverse transcriptase PCR and methods to examine gene expression Differential display cloning Cloning and library screening by PCR Genotype and polymorphism analysis of drug and toxicant metabolizing enzymes Basic, non-PCR based molecular biology methods PCR Protocols in Molecular Toxicology will aid both novices and experienced PCR practitioners in using PCR to its fullest potential.

Analysis of Food Toxins and Toxicants - Yiu-Chung Wong

2017-07-03

Analysis of Food Toxins and Toxicants consists of five sections, providing up-to-date descriptions of the analytical approaches used to detect a range of food toxins. Part I reviews the recent developments in analytical technology including sample pre-treatment and food additives. Part II covers the novel analysis of microbial and plant toxins including plant pyrrolizidine alkaloids. Part III focuses on marine toxins in fish and shellfish. Part IV discusses biogenic amines and common food toxicants, such as pesticides and heavy metals. Part V summarizes quality assurance and the recent developments in regulatory limits for toxins, toxicants and allergens, including discussions on laboratory accreditation and reference materials.

A Laboratory Guide to RNA - Paul A. Krieg 1996-08-15

Here is the most complete guide available to the isolation, analysis, and synthesis of RNA. It covers everything researchers and laboratory workers need to know about the study of gene expression via RNA analysis- from the theory behind the methods, to actual problem-solving techniques. Step-by-step protocols are presented for each method. A careful presentation of the experimental formalities of these protocols enables specialists and nonspecialists alike to implement the methods easily in the laboratory. Each protocol is accompanied by the theoretical background underlying the experimental procedure and most chapters contain illustrations of typical results and troubleshooting tips. A Laboratory Guide to RNA offers a straightforward detailed account of experimental procedures, ranging from the isolation of RNA from a variety of cell and tissue types, detection analysis, and quantitation using a range of

strategies, to large- and small-scale synthesis of RNA. This unique guide not only covers established procedures such as RNA blotting and nuclease protection, but also the latest protocols for quantitative PCR and differential display. Protocols addressing in situ hybridization are highlighted in an eight-page, full-color section that illustrates the power of the technique for detection of gene expression in tissues and whole organisms. Featuring contributions from leading research laboratories and the biotechnology field, A Laboratory Guide to RNA: Isolation, Analysis, and Synthesis provides all the methods required for RNA analysis. It is the ideal laboratory guide for research scientists, graduate students, and lab personnel who need a solid reference on the analysis of gene expression at the RNA level.

PCR Technology - Tania Nolan 2013-06-13

PCR's simplicity as a molecular technique is, in some ways, responsible for the huge amount of innovation that surrounds it, as researchers continually think of new ways to tweak, adapt, and re-formulate concepts and applications. PCR Technology: Current Innovations, Third Edition is a collection of novel methods, insights, and points of view that provides a critical and timely reference point for anyone wishing to use this technology. Topics in this forward-thinking volume include: The purification and handling of PCR templates The effect of the manufacture and purification of the oligonucleotide on PCR behavior Optimum buffer composition Probe options The design and optimization of qPCR assays Issues surrounding the development and refinement of instrumentation Effective controls to protect against uncertainties due to reaction variability Covering all aspects of

PCR and real-time PCR, the book contains detailed protocols that make it suitable as both a reference and an instruction manual. Each chapter presents detailed guidelines as well as helpful hints and tips supplied by authors who are recognized experts in their fields. In addition to descriptions of current technology and best practices, the book also provides information about new developments in the PCR arena.

Emerging Infectious Diseases - 2005

Tools and Techniques in Biomolecular Science - Aysha Divan 2013-03-21

This book reviews the theoretical concepts and experimental details underpinning the broad range of modern technologies that are currently being used to advance our understanding of the biomolecular sciences.

Biotechnology - Jeffrey M. Becker 1996-03-11

The objectives of this Second Edition of Biotechnology: A Laboratory Course remain unchanged: to create a text that consists of a series of laboratory exercises that integrate molecular biology with protein biochemistry techniques while providing a continuum of experiments. The course begins with basic techniques and culminates in the utilization of previously acquired technical experience and experimental material. Two organisms, Sacchaomyces cerevisiae and Escherichia coli, a single plasmid, and a single enzyme are the experimental material, yet the procedures and principles demonstrated are widely applicable to other systems. This text will serve as an excellent aid in the establishment or instruction of introductory courses in the biological sciences. All exercises and appendixes have been updated Includes new exercises on: Polymerase chain

reaction Beta-Galactosidase detection in yeast colonies Western blotting New procedures introduced for: Large-scale plasmid isolation Yeast transformation DNA quantitation New appendixes added, one of which provides details on accessing biological information sites on the Internet (World Wide Web) Use of non-radioactive materials and easy access to microbial cultures Laboratory exercises student tested for seven years

PCR Primer Design - Chhandak Basu 2022-11-28

This third edition provides new and updated chapters on design PCR primers for successful DNA amplification. Chapters are divided into seven parts, including primer design strategies for quantitative PCR, genotyping, multiplex PCR, in silico PCR primer design, and primer design to identify plant and animal viruses. 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 easily accessible, PCR Primer Design, Third Edition aims to be useful for various fields of molecular biology, including biotechnology, molecular genetics, and recombinant DNA technology.

PCR Troubleshooting and Optimization - Suzanne Kennedy 2011

The polymerase chain reaction (PCR) is a fundamental tool in scientific research and clinical testing. Real-time PCR, combining both amplification and detection in one instrument, is a rapid and accurate method for nucleic acid detection and quantification. Although PCR is a very powerful technique, the results achieved are valid only if

the appropriate controls have been employed. In addition, proper optimization of PCR conditions is required for the generation of specific, repeatable, reproducible, and sensitive data. This book discusses the strategies for preparing effective controls and standards for PCR, when they should be employed, and how to interpret the information they provide. It highlights the significance of optimization for efficiency, precision, and sensitivity of PCR methodology and provides essential guidance on how to troubleshoot inefficient reactions. Experts in PCR describe design and optimization techniques, discuss the use of appropriate controls, explain the significance of standard curves, and explore the principles and strategies required for effective troubleshooting. The book highlights the importance of sample preparation and quality, primer design, controlling inhibitors, avoiding amplicon and environmental contamination, optimizing reagent quality and concentration, and modifying the thermal cycling protocol for optimal sensitivity and specificity. In addition, specific chapters discuss the history of PCR, the choice of instrumentation, the applications of PCR in metagenomics, high resolution melting analysis, the MIQE guidelines, and PCR at the microliter scale. The strategies, tips and advice contained in this concise volume will enable the scientist to optimize and effectively troubleshoot a wide range of techniques, including PCR, reverse transcriptase PCR, real-time PCR, and quantitative PCR. It will be an essential book for anyone using PCR technology.

Advanced Technologies for Meat Processing - Fidel Toldrá 2017-10-10

As with the first edition, the main goal of Advanced Technologies for Meat Processing

is to provide the reader with recent developments in new advanced technologies for the full meat- processing chain. This book is written by distinguished international contributors with recognized expertise and excellent reputations, and brings together all the advances in a wide and varied number of technologies that are applied in different stages of meat processing. This second edition contains 21 chapters, combining updated and revised versions of several chapters with entirely new chapters that deal with new online monitoring techniques like hyperspectral imaging and Raman spectroscopy, the use of nanotechnology for sensor devices or new packaging materials and the application of omics technologies like nutrigenomics and proteomics for meat quality and nutrition. The book starts with the control and traceability of genetically modified farm animals, followed by four chapters reporting the use of online non-destructive monitoring techniques like hyperspectral imaging and Raman spectroscopy, real-time PCR for pathogens detection, and nanotechnology-based sensors. Then, five chapters describe different advanced technologies for meat decontamination, such as irradiation, hydrostatic and hydrodynamic pressure processing, other non-thermal technologies, and the reduction in contaminants generation. Nutrigenomics in animal nutrition and production is the object of a chapter that is followed by five chapters dealing with nutritional-related issues like bioactive peptides, functional meats, fat and salt reduction, processing of nitrite-free products, and the use of proteomics for the improved processing of dry-cured meats. The last four chapters are reporting the latest developments in bacteriocins against meat-borne

pathogens, the functionality of bacterial starters, modified atmosphere packaging and the use of new nanotechnology-based materials for intelligent and edible packaging.

Essentials of Nucleic Acid Analysis - Jacquie T. Keer 2008

An indispensable handbook of the highest standard for those working in the fields of food analysis and forensic applications.

Rapid Detection and Characterization of Foodborne Pathogens by Molecular Techniques - Robert E. Levin 2009-10-26

Decades of development of the polymerase chain reaction (PCR) have yielded a significant array of associated techniques that make it possible to rapidly detect low numbers of all known pathogenic microorganisms without the traditional, more taxing methods of cultivation and phenotypic characterization. Written by one of the most prolific and respected researchers in food safety, Rapid Detection and Characterization of Foodborne Pathogens by Molecular Techniques describes the application of molecular techniques for the detection and discrimination of major infectious bacteria associated with foods. The book puts a particular focus on genes associated with pathogenicity used in PCR, including real-time PCR for specific detection of pathogenic bacteria and the inherent limitations of such methodology with certain pathogens. It also emphasizes methods for extracting microorganisms from complex food matrices and DNA purification techniques. The coverage begins with a highly comprehensive review of real time PCR, complete with theoretical and operational concepts. Each chapter deals with a specific organism and the techniques applied to that organism. The text includes references on the use of PCR

primers and DNA probes, the DNA sequence of each being listed at the end of each chapter to create a complete compendium. This is not a "recipe book", but rather a resource with sufficiently detailed information that allows readers to fully comprehend the methodology described and the significance of the results. Copiously illustrated with figures, tables, charts, and graphs, this is a detailed presentation of the major, contemporary studies involving the molecular detection, quantification, and subspecies differentiation of each organism. With objective assessments of the molecular techniques, their advantages, and limitations, the book allows investigators to readily identify the precise molecular technique and application most suitable for their research.

RT-PCR Protocols - Nicola King 2008-02-04

Until the mid 1980s, the detection and quantification of a specific mRNA was a difficult task, usually only undertaken by a skilled molecular biologist. With the advent of PCR, it became possible to amplify specific mRNA, after first converting the mRNA to cDNA via reverse transcriptase. The arrival of this technique—termed reverse transcription-PCR (RT-PCR)—meant that mRNA suddenly became amenable to rapid and sensitive analysis, without the need for advanced training in molecular biology. This new accessibility of mRNA, which has been facilitated by the rapid accumulation of sequence data for human mRNAs, means that every biomedical researcher can now include measurement of specific mRNA expression as a routine component of his/her research plans. In view of the ubiquity of the use of standard RT-PCR, the main objective of RT-PCR Protocols is essentially to provide novel, useful

applications of RT-PCR. These include some useful adaptations and applications that could be relevant to the wider research community who are already familiar with the basic RT-PCR protocol. For example, a variety of different adaptations are described that have been employed to obtain quantitative data from RT-PCR. Quantitative RT-PCR provides the ability to accurately measure changes/imb-ances in specific mRNA expression between normal and diseased tissues.

PCR Troubleshooting - Michael L. Altshuler 2006

This unique polymerase chain reaction (PCR) troubleshooting guide is an essential companion for readers with some experience in PCR. The book discusses the many and varied problems encountered with PCR, together with tips, advice, and procedures to obviate rather than overcome the PCR problems. The advice in PCR Troubleshooting is invaluable.

Pricing and Profitability Management - Julie Meehan 2011-06-28

The practical guide to using pricing and profitability management to build a better business A comprehensive reference for any business professional looking to understand the capabilities and competencies required for effectively managing pricing and profitability, Pricing and Profitability Management explains how to determine the right approach, tools, and techniques for each of six key categories (pricing strategy, price execution, advanced analytics and optimization, organizational alignment and governance, pricing technology and data management, and tax and regulatory effectiveness). Exploring each category in detail, the book addresses how an integrated approach to pricing improvement can give a

sustainable, competitive advantage to any organization. The ultimate "how to" manual for any executive or manager interested in price management, the book presents a holistic, comprehensive framework that shows how integrating these pricing categories into a cohesive program leads to impressive gains that cannot be achieved through a single-pronged approach. Presents a comprehensive framework for more effectively managing pricing and profitability Identities the six key categories of pricing and profitability management Shows you how to gain a competitive edge by managing pricing and profitability Taking a comprehensive view of pricing, companies can position themselves to tap a vast source of shareholder value—the ability to set and enforce profitable prices, not just once, but again and again in response to marketplace changes and evolving business needs—and this book will show you how.

Molecular Microbiology - David H. Persing 2020-07-24

Presenting the latest molecular diagnostic techniques in one comprehensive volume The molecular diagnostics landscape has changed dramatically since the last edition of Molecular Microbiology: Diagnostic Principles and Practice in 2011. With the spread of molecular testing and the development of new technologies and their opportunities, laboratory professionals and physicians more than ever need a resource to help them navigate this rapidly evolving field. Editors David Persing and Fred Tenover have brought together a team of experienced researchers and diagnosticians to update this third edition comprehensively, to present the latest developments in molecular diagnostics in the support of clinical care and of basic and clinical research,

including next-generation sequencing and whole-genome analysis. These updates are provided in an easy-to-read format and supported by a broad range of practical advice, such as determining the appropriate type and quantity of a specimen, releasing and concentrating the targets, and eliminating inhibitors. Molecular Microbiology: Diagnostic Principles and Practice Presents the latest basic scientific theory underlying molecular diagnostics Offers tested and proven applications of molecular diagnostics for the diagnosis of infectious diseases, including point-of-care testing Illustrates and summarizes key concepts and techniques with detailed figures and tables Discusses emerging technologies, including the use of molecular typing methods for real-time tracking of infectious outbreaks and antibiotic resistance Advises on the latest quality control and quality assurance measures Explores the increasing opportunities and capabilities of information technology Molecular Microbiology: Diagnostic Principles and Practice is a textbook for molecular diagnostics courses that can also be used by anyone involved with diagnostic test selection and interpretation. It is also a useful reference for laboratories and as a continuing education resource for physicians.

High Throughput Screening for Food Safety Assessment - Arun K. Bhunia 2014-09-06

Recent advances in array-based detectors and imaging technologies have provided high throughput systems that can operate within a substantially reduced timeframe and other techniques that can detect multiple contaminants at one time. These technologies are revolutionary in terms of food safety assessment in manufacturing, and will also have a significant impact on areas

such as public health and food defence. This book summarizes the latest research and applications of sensor technologies for online and high throughput screening of food. The book first introduces high throughput screening strategies and technology platforms, and discusses key issues in sample collection and preparation. The subsequent chapters are then grouped into four sections: Part I reviews biorecognition techniques; Part II covers the use of optical biosensors and hyperspectral imaging in food safety assessment; Part III focuses on electrochemical and mass-based transducers; and finally Part IV deals with the application of these safety assessment technologies in specific food products, including meat and poultry, seafood, fruits and vegetables. Summarises the latest research on sensor technologies for online and high-throughput screening of food Covers high-throughput screening and the current and forecast state of rapid contaminant detection technologies Looks at the use of optical and electrochemical biosensors and hyperspectral imaging in food safety assessment and the application of these technologies in specific food products

PCR - Mike McPherson 2007-01-25

A thoroughly updated version of the successful first edition with a new chapter on Real-Time PCR, more prokaryotic applications, and more detail in the complex mutagenesis sections. Information on PCR applications in genomics and proteomics have been expanded and integrated throughout the text. There is also advice on available products and specific pointers to the most appropriate methods. As with the first edition, this will be an ideal practical introduction and invaluable guide to PCR and its applications.

PCR - MCPHERSON. 2000

A thoroughly updated version of the successful first edition, with a new chapter on Real-Time PCR, more prokaryotic applications, and more detail in the complex mutagenesis sections.

PCR Applications - Michael A. Innis 1999-05-11

PCR is the most powerful technique currently used in molecular biology. It enables the scientist to quickly replicate DNA and RNA on the benchtop. From its discovery in the early 80's, PCR has blossomed into a method that enables everything from ready mutation of DNA/RNA to speedy analysis of tens of thousands of nucleotide sequences daily. PCR Applications examines the latest developments in this field. It is the third book in the series, building on the previous publications PCR Protocols and PCR Strategies. The manual discusses techniques that focus on gene discovery, genomics, and DNA array technology, which are contributing factors to the now-occurring bioinformatics boom. Key Features * Focuses on gene discovery, genomics, and DNA array technology * Covers quantitative PCR techniques, including the use of standards and kinetic analysis includes statistical refinement of primer design parameters * Ilustrates techniques used in microscopic tissue samples, such as single cell PCR, whole cell PCR, laser capture microdissection, and in situ PCR Entries provide information on: * Nomenclature * Expression * Sequence analysis * Structure and function * Electrophysiology * Parmacology * Information retrieval