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MicroRNA Expression Detection Methods



Springer

Microrna Expression Detection Methods

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Microrna Expression Detection Methods:

MicroRNA Expression Detection Methods Zhiguo Wang, Baofeng Yang, 2009-12-23 MicroRNAs miRNAs endogenous noncoding regulatory mRNAs of nucleotides have rapidly emerged as the central players in gene expression regulation. Owing to their ever increasing implications in the control of various biological and pathological processes miRNAs have now been considered novel biomarkers of various human diseases including cancer viral disease cardiovascular disorders metabolic disturbances etc. Particular expression profiles have been associated with particular pathological states. Expression profiling of miRNAs have therefore become extremely important not only for fundamentalists but also for clinicians. However the methodologies used for detecting protein coding mRNAs cannot be directly applied to miRNAs because of their small size. Over the past years researchers have made great efforts to developing techniques suitable for miRNA detection and quantification a wide spectrum of creative and innovative techniques more than 30 different methods have been invented and validated. It has come to the time now to summarize these methods and present them in an orderly manner for better understanding and utilization of these methods to miRNA research and applications. In particular the development of methods for quantifying circulating miRNAs opens up a fascinating opportunity for realizing miRNA as diagnostic and prognostic biomarkers of human disease. A book on this subject may help boosting up the passion of researchers to further improve the existing techniques and develop more new methods to fit to new application needs. These considerations prompted us and urged us to undertake the work writing a book focusing on miRNA expression detection methods.

MicroRNA Detection and Target Identification Tamas Dalmay, 2023-01-23 This updated volume reflects new and evolved techniques to study detection profiling and manipulation of microRNAs miRNAs in plants and animals. After overviews of how best to detect identify and validate microRNAs the book continues by exploring state of the art protocols for microRNA detection approaches to profile the expression level of microRNAs spatial expression analysis describe in silico analysis of microRNAs and their targets as well as protocols for functional analysis of microRNAs and their targets by CRISPR Cas. Written for the highly successful *Methods in Molecular Biology* series chapters include introductions to their respective topics lists of the necessary materials and reagents step by step and readily reproducible laboratory protocols and tips on troubleshooting and avoiding known pitfalls. Authoritative and up to date *MicroRNA Detection and Target Identification Methods and Protocols* Second Edition aims to ensure successful results in the further study of this vital field.

MicroRNA Junjie Xiao, 2022-07-19 *MicroRNA From Bench to Bedside* provides an in depth expansive overview of microRNA from fundamentals to clinical practice. It presents researchers with detailed insights on the topic of microRNA exploring foundational knowledge that is followed by methodologies and the latest technologies for research and potential theragnostic and therapeutic applications for specific diseases. The book consists of eight parts beginning with an introduction to microRNA and the current state of the field followed by sections on biogenesis and maturation of microRNA and methodology and bioinformatics where chapters

focus on isolation and detection techniques Sections then move on to molecular mechanisms and gene regulation considering topics such as transcriptional regulation and epigenetic regulation as well as the role of microRNA as biomarkers

Additionally microRNA and human disease and microRNA based therapeutics are explored focusing on a wide range of diseases such as cancer age related disease cardiovascular disease microRNA targeted therapy in hepatitis and therapeutic strategies for diabetes The book concludes with a discussion on advances and future perspectives in microRNA investigation

Covers the topic of microRNA in detail from foundational knowledge to clinical application Explores the physiological and pathological roles of microRNAs in various human diseases including neurological cardiovascular and age related diseases

Discusses future directions and challenges in the field Includes chapters on methodology and bioinformatics for microRNA research

MicroRNA Detection and Pathological Functions Xueji Zhang,Haifeng Dong,Yaping Tian,2015-05-26 This book summarizes microRNA miRNA biology in a variety of pathological processes emphasizing the significant potential applications of miRNA in diagnostics and prognostics as well as novel drug targets The conventional techniques used for miRNA detection including standard PCR Northern blotting microarray and clone methods are addressed Recent emerging strategies in miRNA detection and quantification with superior flexibility and adaptability such as novel molecular biological techniques and locked nucleic acid LNA modified probes as well as nanotechnology based approaches are also included The book also highlights the latest advances in clinical related miRNA detection methods in living cells circulating blood and tissue such as in situ hybridization ISH and molecular imaging techniques which are useful to elucidate the biogenesis and biological function of miRNAs in vivo Finally the respective advantages and drawbacks of various detection techniques in this fast moving field are discussed along with the challenges and promising new directions This book offers a valuable resource for analytical chemists biologists and physicians involved in miRNA research Dr Xueji Zhang and Dr Haifeng Dong are Professors at the School of Chemistry Biological Engineering University of Science Technology Beijing USTB China Dr Yaping Tian is a Professor at the Department of Clinical Biochemistry Chinese PLA General Hospital and Military Medical School China

Gastric Cancer Prewarning and Early Diagnosis System Daxiang Cui,2017-06-21 The book explores recent developments in the application of nanotechnology in the early detection of gastric cancer It discusses various aspects such as screening for gastric cancer associated biomarkers establishing new ultrasensitive detection methods based on nanoparticle labeling and nanoeffects developing a new generation of nanodevices for high throughput examination of serum and breath biomarkers developing multifunctional nanoprobe for targeted imaging and simultaneous therapy of gastric cancer evaluating the biosafety of multifunctional nanoprobe and the establishment of a pre warning and early diagnosis system It also presents clinical applications and prospects The book provides a valuable reference for researchers in nanomedicine and clinicians involved in gastric cancer and radiology

Luminescence-based MicroRNA Detection Methods Kyle A. Cissell,2010 MicroRNAs miRNA are short 18-24 nucleotide long noncoding RNAs These small RNAs which

are initially transcribed in the nucleus are transported into the cell cytoplasm where they regulate protein translation either through direct cleavage of mRNA or indirect inhibition through binding to mRNA and disrupting the protein translation machinery Recently miRNAs have gained much attention due to their implication in numerous diseases and cancers It has been found that heightened or lowered levels of miRNA in diseased cells vs healthy cells are linked to disease progression It is therefore immensely important to be able to detect these small molecules Current detection methods of Northern blotting microarrays and qRT PCR suffer from drawbacks including low sensitivity a lack of simplicity being semi quantitative in nature time consuming and requiring expensive instruments This work aims to develop novel miRNA technologies which will address these above problems Bioluminescent labels are promising alternatives to current methods of miRNA detection Bioluminescent labels are relatively small similar in size to fluorescent proteins and they emit very intense signals upon binding to their substrate Bioluminescent labels are advantageous to fluorescent labels in that they do not require an external excitation source rather the excitation energy is supplied through a biochemical reaction Therefore background signal due to excitation is eliminated They also have the advantage of being produced in large amounts through bacterial expression Four miRNA detection methods are presented which utilize luminescence based methods Three employ Renilla luciferase a bioluminescent protein and one is based on fluorescence The presented methods are capable of detecting miRNA from the picomole nanomolar level down to the femtomole picomolar level These methods are rapid sensitive simple and quantitative can be employed in complex matrices and do not require expensive instruments All methods are hybridization based and do not require amplification steps

MicroRNA Methods John J. Rossi, 2007-08-30 MicroRNAs miRNA are tiny bits of genetic material that were unknown nearly 10 years ago but now represent an exciting field of study in biology Upon their discovery researchers revealed for the first time a new mechanism by which microRNA can stop the function of messenger RNA mRNA by literally cutting it in half interfering with the normal function of specific messenger RNAs in gene expression This expression of genes that code for essential proteins is essentially what controls whether a cell turns into a liver lung or brain cell for example Understanding what activates this process or stops it is a key to understanding the biological process and builds a foundation for advances in medicine and other fields This volume in Methods in Enzymology presents valuable methods for studying MicroRNA with three sections covering identification of MicroRNAs and their targets MicroRNA expression maturation and functional analysis and MicroRNAs and disease

MicroRNA Expression in Normal and Degenerative (rdl) Mouse Retinas and Analysis of Selected MiRNAs that Show Unique Age- and Gender- Specific Expression Roman Deniskin, 2009

Wiley Encyclopedia of Chemical Biology, Volume 2 Tadhg P. Begley, 2009-02-03 The first major reference at the interface of chemistry biology and medicine Chemical biology is a rapidly developing field that uses the principles tools and language of chemistry to answer important questions in the life sciences It has enabled researchers to gather critical information about the molecular biology of the cell and is the

fundamental science of drug discovery playing a key role in the development of novel agents for the prevention diagnosis and treatment of disease Now students and researchers across the range of disciplines that use chemical biology techniques have a single resource that encapsulates what is known in the field It is an excellent place to begin any chemical biology investigation Major topics addressed in the encyclopedia include Applications of chemical biology Biomolecules within the cell Chemical views of biology Chemistry of biological processes and systems Synthetic molecules as tools for chemical biology Technologies and techniques in chemical biology Some 300 articles range from pure basic research to areas that have immediate applications in fields such as drug discovery sensor technology and catalysis Novices in the field can turn to articles that introduce them to the basics whereas experienced researchers have access to articles exploring the cutting edge of the science Each article ends with a list of references to facilitate further investigation With contributions from leading researchers and pioneers in the field the Wiley Encyclopedia of Chemical Biology builds on Wiley s unparalleled reputation for helping students and researchers understand the crucial role of chemistry and chemical techniques in the life sciences

MicroRNAs as Tools in Biopharmaceutical Production Niall Barron,2012-11-15 Focused manuscript on the potential use role of miRNAs in bioprocessing specifically the production of complex proteins in mammalian cells With that in mind I propose a draft list of topics chapters along the following lines Intro on CHO bioprocessing engineering challenges to set scene Genomic organization biogenesis and mode of action Identifying miRNA targets Computational prediction transcriptomics proteomics UTR analysis etc miRNA expression in Chinese Hamster Ovary cells miRNAs as engineering targets pathway manipulation to impact bioprocess phenotypes miRNAs as biomarkers Detection methods Northern PCR hybridization arrays Next Gen Seq Manipulation of expression in cultured cells Transient stable transfection Knockout

Genome Research ,2009 **Applied Spectroscopy** ,2009 American Journal of Respiratory and Critical Care Medicine ,2009 **MicroRNA Profiling** Sweta Rani,2022-11-28 This second edition provides updated and comprehensive methods on miRNA biogenesis and their role in the development and progression of various human diseases Chapters detail miRNA biogenesis isolating RNA extracellular vesicles EVs circulating miRNAs analyzing miRNA and miRDeep P2 protocols for total RNA isolation from cells cell derived products isolation and characterization of exosomes serum plasma specimens and software tools Written in the successful Methods in Molecular Biology series format chapters include introductions to their respective topics lists of the necessary materials and reagents step by step readily reproducible protocols and notes on troubleshooting and avoiding known pitfalls Authoritative and cutting edge MicroRNA Profiling Methods and Protocols Second Edition aims to provide comprehensive and accessible methods to undergraduate graduate and established scientist

Proceedings of the Fourth International Symposium on Seed, Transplant and Stand Establishment of Horticultural Crops Daniel I. Leskovar,2008 This volume contains 48 papers presented from lectures and posters at the Fourth International Symposium on Seed Transplant and Stand Establishment of Horticultural Crops arranged in eight

topical areas seed biotechnology and genetics seed germination and vigor seed technology conventional transplant
production and technology organic seed transplant production abiotic biotic stress grafting stand establishment and field
performance **Cancer Research** ,2009-07 **Canadian Journal of Botany** ,2006 **Pacific Symposium on**
Biocomputing ,2008 **American Journal of Veterinary Research** ,2012 Volumes for 1956 include selected papers from
the proceedings of the American Veterinary Medical Association

Reviewing **Microrna Expression Detection Methods**: Unlocking the Spellbinding Force of Linguistics

In a fast-paced world fueled by information and interconnectivity, the spellbinding force of linguistics has acquired newfound prominence. Its capacity to evoke emotions, stimulate contemplation, and stimulate metamorphosis is truly astonishing. Within the pages of "**Microrna Expression Detection Methods**," an enthralling opus penned by a very acclaimed wordsmith, readers set about an immersive expedition to unravel the intricate significance of language and its indelible imprint on our lives. Throughout this assessment, we shall delve in to the book is central motifs, appraise its distinctive narrative style, and gauge its overarching influence on the minds of its readers.

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