Proteoglycan Protocols Methods In Molecular Biology

#proteoglycan protocols #molecular biology methods #glycobiology techniques #extracellular matrix research #biochemical analysis

Explore comprehensive proteoglycan protocols and cutting-edge methods essential for molecular biology research. This resource provides detailed techniques for isolating, characterizing, and studying proteoglycans, crucial for understanding their roles in cellular processes and disease mechanisms.

Proteoglycan Protocols

Proteoglycans are some of the most elaborate macromolecules of mammalian and lower organisms. The covalent attachment of at least five types of glycosami- glycan side chains to more than forty individual protein cores makes these molecules quite complex and endows them with a multitude of biological functions. Proteoglycan Protocols offers a comprehensive and up-to-date collection of prepative and analytical methods for the in-depth analysis of proteoglycans. Featuring st- by-step detailed protocols, this book will enable both novice and experienced researchers to isolate intact proteoglycans from tissues and cultured cells, to establish the composition of their carbohydrate moieties, to generate strategies for prokaryotic and eukaryotic expression, to utilize methods for the suppression of specific proteoglycan gene expression and for the detection of mutant cells and degradation products, and to study specific interactions between proteoglycans and extracellular matrix proteins as well as growth factors and their receptors. The readers will find concise, yet comprehensive techniques carefully drafted by leading experts in the field. Each chapter commences with a general Introduction, followed by a detailed Materials section, and an easy-to-follow Methods section. An asset of each chapter is the extensive notation that includes troubleshooting tips and practical considerations that are often lacking in formal methodology papers. The reader will find this section most valuable because it is clearly provided by experienced scientists who have first-hand knowledge of the techniques they outline. In addition, most of the chapters are well illustrated with examples of typical data generated with each method.

Methods in Molecular Biology: Proteoglycan protocols

This volume is a comprehensive and up-to-date collection of strategies, reproducible methods, and protocols for the in-depth analysis of Proteoglycans (PGs) and their glycan part, the GAGs. Chapters are divided into three parts detailing GAGs in biological specimens, protocols for the evaluation of the in vitro and in vivo effects of PGs/GAGs, and protocols for compounds related with the metabolic enzymes, epigenetic regulation, and PGs/GAGs-based inhibitors. Written in the format of the highly successful

Methods in Molecular Biology series, each chapter includes an introduction to the topic, lists necessary materials and methods, includes tips on troubleshooting and known pitfalls, and step-by-step, readily reproducible protocols. Cutting-edge and thorough, Proteoglycans: Methods and Protocols aims to provide information on the elucidated the structural and functional aspects of the complex matrix macromolecules such as the proteoglycans and glycosaminoglycans.

Proteoglycans

Hans Neurath has written that this is the second golden era of enzymology {Protein Science [1994], vol. 3, pp. 1734—1739); he could with justice have been more general and referred to the second golden age of protein chemistry. The last two decades have seen enormous advances in our understanding of the structures and functions of pro teins arising on the one hand from improvements and developments in analytical techniques {see the companion volume, Basic Protein and Peptide Protocols, in this series) and on the other hand from the tech nologies of molecular genetics. Far from turning the focus away from protein science, the ability to isolate, analyze, and express genes has increased interest in proteins as gene products. Hence, many laborato ries are now getting involved in protein isolation for the first time, either as an essential adjunct to their work in molecular genetics or because of a curiosity to know more about the products of the genes that they have been studying. Protein Purification Protocols is aimed mainly at these newcom ers to protein purification, but it is hoped that it will also be of value to established practitioners who may find here techniques that they have not tried, but which might well be most applicable in their work. With the exception mainly of the first and last chapters, the format of the contributions to the present book conform to the established format of the Methods in Molecular Biology series.

Protein Purification Protocols

Protein engineering is a fascinating mixture of molecular biology, protein structure analysis, computation, and biochemistry, with the goal of developing useful or valuable proteins. Protein Engineering Protocols will consider the two general, but not mutually exclusive, strategies for protein engineering. The first is known as rational design, in which the scientist uses detailed knowledge of the structure and function of the protein to make desired changes. The s- ond strategy is known as directed evolution. In this case, random mutagenesis is applied to a protein, and selection or screening is used to pick out variants that have the desired qualities. By several rounds of mutation and selection, this method mimics natural evolution. An additional technique known as DNA shuffling mixes and matches pieces of successful variants to produce better results. This process mimics recombination that occurs naturally during sexual reproduction. The first section of Protein Engineering Protocols describes rational p- tein design strategies, including computational methods, the use of non-natural amino acids to expand the biological alphabet, as well as impressive examples for the generation of proteins with novel characteristics. Although procedures for the introduction of mutations have become routine, predicting and und- standing the effects of these mutations can be very challenging and requires profound knowledge of the system as well as protein structures in general.

Protein Engineering Protocols

Glycobiology involves studies of complex carbohydrates and posttrans- tional modifications of proteins, and has become an important interdiscip- nary field encompassing chemistry, biochemistry, biology, physiology, and pathology. Although initial research was directed toward elucidation of the different carbohydrate structures and the enzymes synthesizing them, the field has now moved toward identifying the functions of carbohydrates. The pro- cols described in Glycobiology Protocols form a solid basis for investigations of glycan functions in health and disease. The cloning of many of the genes participating in glycosylation processes has helped to enhance our knowledge of how glycosylation is controlled, but has also added another dimension of complexity to the great heterogeneous variety of the structures of the oligos- charides of glycoproteins, proteoglycans, and glycolipids. A family of similar enzyme proteins exists for each glycosylation step. Glycosyltransferases are extremely specific for both the nucleotide sugar donor and the acceptor s- strate, but many other factors control sugar transfer, including the locali- tion and topology of enzymes, cofactors, possible chaperone proteins, and the availability of sugar acceptor substrates. The analysis of the intracellular organization of glycosylation and of the factors controlling the activities of the participating enzymes in the cell are important areas that need more research efforts. Another challenge for future research is to understand the glycodynamics of a

cell, that is, how the cell responds to stimuli leading to biological and pathological changes in terms of alterations in glycosylation, and how this affects the biology of the cell.

Glycobiology Protocols

In Protein Dynamics: Methods and Protocols, expert researchers in the field detail both experimental and computational methods to interrogate molecular level fluctuations. Chapters detail best-practice recipes covering both experimental and computational techniques, reflecting modern protein research. 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 key tips on troubleshooting and avoiding known pitfalls.

Glycoanalysis Protocols

Due to the significant contributions of carbohydrates to the functional diversity of the cell, the challenging study of the glycome has expanded beyond the research of carbohydrate experts and into the wider scope of the life sciences. To aid all scientists now delving into this vital subject area, Glycomics: Methods and Protocols collects a compendium of detailed laboratory protocols reflecting the increasing availability of sample preparation, chromatographic, electrophoretic, mass spectrometric, and bioinformatic tools specifically designed for the analysis of glycosylation. Leading researchers in the field address subjects such as glycoprotein and proteoglycan analysis, glycosylation structure determination, as well as various approaches to investigate the interaction between glycans and a variety of carbohydrate-recognizing proteins in order to aid exploration into the functional significance of the oligosaccharides. Written in the highly successful Methods in Molecular BiologyTM series format, the 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, Glycomics: Methods and Protocols serves as a valuable guide for experimenters facing the challenges of glycan analysis in hope of providing further insights into the biology of cell-cell communication and interaction.

Protein Dynamics

-- 145 concise, step-by-step protocols for the analysis of proteins and peptides -- Provides more than three times as many protocols than the competitors' manuals -- in the incomparable Methods in Molecular Biology "TM" style -- at an affordable price -- Combound in a large 7 x l0 inch format for easy benchtop use -- An indispensable reference for industry-based researchers, professors, and their students

Glycomics

This book focuses on recent developments of Pichia pastoris as a recombinant protein production system. Highlighted topics include a discussion on the use of fermentors to grow Pichia pastoris, information on the O- and N-linked glycosylation, methods for labeling Pichia pastoris expressed proteins for structural studies, and the introduction of mutations in Pichia pastoris genes by the methods of restriction enzyme-mediated integration (REMI). Each chapter presents cutting-edge and cornerstone protocols for utilizing P. pastoris as a model recomibinant protein production system. This volume fully updates and expands upon the first edition.

The Protein Protocols Handbook

This book compiles key protocols instrumental to the study of high-throughput protein production and purification which have been refined and simplified over the years and are now ready to be transferred to any laboratory. Beginning with a section covering general procedures for high-throughput protein production, the volume continues with high-throughput protocols adapted to the production of specific protein families, as well as an extensive section on protocols combining high-throughput protein production and their micro-characterization. Written for the highly successful Methods in Molecular Biology series, chapters in this book include introductions to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, and tips on troubleshooting and avoiding known pitfalls. Authoritative and practical, High-Throughput Protein Production and Purification: Methods and Protocols serves biochemists ranging from engineers, PhD

students and post-doctoral fellows, to the heads of protein expression facilities and researchers, in pursuing this vital area of study.

Pichia Protocols

This detailed volume provides a comprehensive collection of classic and cutting-edge methods and techniques in mapping protein-protein interactions. The chapters include a variety of in vitro and in vivo experimental methods covering cell biology, biochemistry, and biophysics. In addition, the book also explores in silico methods including sequence-, structure-, and phylogenetic profile-based approaches as well as gene expression and machine learning methods. 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, as well as tips on troubleshooting and avoiding known pitfalls. Authoritative and practical, Protein-Protein Interactions: Methods and Protocols serves as an ideal guide for researchers working in protein science and beyond.

High-Throughput Protein Production and Purification

With the recent completion of the sequencing of the human genome, it is widely anticipated that the number of potential new protein drugs and targets will escalate at an even greater rate than that observed in recent years. However, identification of a potential target is only part of the process in developing these new next generation protein-based “drugs” that are increasingly being used to treat human disease. Once a potential protein drug has been identified, the next rate-limiting step on the road to development is the production of sufficient authentic material for testing, charact- ization, clinical trials, and so on. If a protein drug does actually make it through this lengthy and costly process, methodology that allows the production of the protein on a scale large enough to meet demand must be implemented. Furthermore, large-scale production must not compromise the authenticity of the final product. It is also nec- sary to have robust methods for the purification, characterization, viral inactivation and continued testing of the authenticity of the final protein product and to be able to formulate it in a manner that retains both its biological activity and lends itself to easy administration. Therapeutic Proteins: Methods and Protocols covers all aspects of protein drug production downstream of the discovery stage. This volume contains contributions from leaders in the field of therapeutic protein expression, purification, characterization, f- mulation, and viral inactivation.

Protein-Protein Interactions

This volume presents the latest developments of the main pillars of protein analysis, such as sample preparation, separation and characterization. The book begins by describing basic but important sample preparation protocols. It then goes on to describe more sophisticated procedures on en-riching specific protein classes and concludes with detailed descriptions of integrated work-flows for comprehensive protein analysis and characterization. The authors of the individual chapters are renowned protein biochemists who have all set value to provide a detailed representation of their lab work. Throughout the chapters, these authors share important tips and tricks for a successful and reproducible employment of their protocols in other laboratories. Written in the highly successful Methods in Molecular Biology series format, chapters include introductions to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols and tips on troubleshooting and avoiding known pitfalls. Authoritative and cutting-edge, Proteomic Profiling: Methods and Protocols is the perfect guide for students of Biochemistry, Biomedicine, Biology, and Genomics and will be an invaluable source for the experienced, practicing scientists.

Therapeutic Proteins

This detailed volume compiles state-of-the-art protocols that will serve as recipes for scientists researching collagen, an abundant protein with great importance to health and disease, as well as in applications like food, cosmetics, pharmaceuticals, cosmetic surgery, artificial skin, and glue. Beginning with a section on in vitro models for the characterization of collagen formation, the book continues by highlighting large-scale analysis of collagen with mass spectrometry in order to elucidate the proteomics, degradomics, interactomes, and cross-linking of collagen, high resolution imaging approaches for collagen by the use of scanning electron microscopy and multiphoton imaging, as well as the role of collagen during physiological and pathological conditions. Written for the highly successful Methods in Molecular Biology series, chapters include introductions to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, and

tips on troubleshooting and avoiding known pitfalls. Authoritative and practical, Collagen: Methods and Protocols is an ideal guide to high quality and repeatable protocols in this vital field of study.

Proteomic Profiling

This volume explores the latest techniques and methods used for performing up-to-date glycosylation research. The chapters in this book are organized into four parts. Part One looks at the latest analytical and bioinformatics technologies that enable the characterization of glycosylation complexity. Part Two details the importance of synthetic chemistry and glycoengineering in the fields of bioprocessing and biotherapeutic development. Part Three discusses systems biology and computational technologies used by scientists to analyze glycosylation events in the cell. Part Four focuses on how cellular glycosylation biomarkers can be identified and used to characterize human clinical datasets. Written in the highly successful Methods in Molecular Biology series format, chapters include introductions to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, and tips on troubleshooting and avoiding known pitfalls. Cutting-edge and practical, Glycosylation: Methods and Protocols is a valuable resource for any scientist or researcher interested in learning more about this exciting and developing field. .

Collagen

In this updated volume, experts from around the world provide the latest protocols for isolating different organelles and the localization of particular proteins using a variety of methods such as light, confocal, and electron microscopy. Emphasis is placed on protein targeting of cellular compartments in both prokaryotic and eukaryotic systems. The book includes targeting protocols from different systems.

Glycosylation

This volume provides comprehensive protocols on experimental and computational methods that are used to study probe protein folding reactions and mechanisms. Chapters divided into five parts detail protein engineering, protein chemistry, experimental approaches to investigate the thermodynamics and kinetics of protein folding transitions, probe protein folding at the single molecule, analysis and interpretation of computer simulations, procedures and tools for the prediction of protein folding properties. Written in the format of the highly successful Methods in Molecular Biology series, each chapter includes an introduction to the topic, lists necessary materials and reagents, includes tips on troubleshooting and known pitfalls, and step-by-step, readily reproducible protocols. Authoritative and cutting-edge, Protein Folding: Methods and Protocols aims to be a useful practical guide to researches to help further their study in this field.

Protein Targeting Protocols

Thousands of proteins have been identified to be acetylated. Immense research power has been dedicated to experiments to solve the biological implications of each and every protein acetylation. Two particular sites of protein acetylation have been described intensively: the N-terminal methionine residue of a nascent protein and lysine residues within a protein. In Protein Acetylation: Methods and Protocols, expert researchers in the field detail many of the methods which are now commonly used to study protein acetylation. These include methods and techniques for identification of protein acetylation, column- and gel electrophoresis-based approaches, computationally prediction, and the biological response to protein acetylation. 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 key tips on troubleshooting and avoiding known pitfalls. Authoritative and practical, Protein Acetylation: Methods and Protocols seeks to aid scientists in the further study of the technical aspects involved in understanding protein acetylation.

Protein Folding

This volume explores techniques that study interactions between proteins in different species, and combines them with context-specific data, analysis of omics datasets, and assembles individual interactions into higher-order semantic units, i.e., protein complexes and functional modules. The chapters in this book cover computational methods that solve diverse tasks such as the prediction of functional protein-protein interactions; the alignment-based comparison of interaction networks by SANA; using

the RaptorX-ComplexContact webserver to predict inter-protein residue-residue contacts; the docking of alternative confirmations of proteins participating in binary interactions and the visually-guided selection of a docking model using COZOID; the detection of novel functional units by KeyPathwayMiner and how PathClass can use such de novo pathways to classify breast cancer subtypes. Written in the highly successful Methods in Molecular Biology series format, chapters include introductions to their respective topics, lists of the necessary hardware- and software, step-by-step, readily reproducible computational protocols, and tips on troubleshooting and avoiding known pitfalls. Cutting-edge and comprehensive, Protein-Protein Interaction Networks: Methods and Protocols is a valuable resource for both novice and expert researchers who are interested in learning more about this evolving field.

Electrophoretic Separation of Proteins

This volume covers a wide spectrum of techniques and approaches that are used in the upstream and downstream processing for recombinant glycoprotein production. Chapters guide the reader through state-of-art of therapeutic recombinant glycoproteins, explores the patent literature, expression systems used for glycoproteins production, methods employed in the downstream processing of different glycoproteins, and information about analytical tools and formulation strategies. Written in the highly successful Methods in Molecular Biology series format, chapters include introductions to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, and tips on troubleshooting and avoiding known pitfalls. Authoritative and cutting-edge, Recombinant Glycoprotein Production: Methods and Protocols aims to ensure successful results in the further study of this vital field

Protein Acetylation

Each chapter in this Methods in Molecular Biology book details a specific electrophoretic variant, so that scientists can perform new techniques without difficulty. Includes step-by-step protocols, troubleshooting advice and tips on avoiding pitfalls."

Protein-Protein Interaction Networks

Due to the vital biological importance of RNA and proteins functioning together within a cell, a protocol volume describing experimental procedures to study their interactions should find a home in many laboratories. RNA-Protein Interaction Protocols, Second Edition updates, complements, and expands upon the popular first edition by providing a collection of cutting-edge techniques developed or refined in the past few years along with tried-and-true methods. The expert contributors explore the isolation and characterization of RNA-protein complexes, the analysis and measurement of RNA-protein interaction, and related novel techniques and strategies. Written in the highly successful Methods in Molecular BiologyTM series format, the chapters include brief introductions to the material, lists of necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, and a Notes section which highlights tips on troubleshooting and avoiding known pitfalls. Comprehensive and up-to-date, RNA-Protein Interaction Protocols, Second Edition is an ideal guide for researchers continuing the study of this all-important biological partnership.

Current Protocols in Molecular Biology

This volume serves to aid researchers working in the recombinant protein production field by describing a wide number of protocols and examples. Chapters describe recombinant protein production in different expression systems, prokaryotic and eukaryotic expression systems, purification protocols, characterization of insoluble proteins and a general overview of interesting applications of insoluble proteins. Written in the format of the highly successful Methods in Molecular Biology series, each chapter includes an introduction to the topic, lists necessary materials and reagents, includes tips on troubleshooting and known pitfalls, and step-by-step, readily reproducible protocols. Authoritative and cutting-edge, Insoluble Proteins: Methods and Protocols, Second Edition aims to be a useful practical guide to researches to help further their study in this field.

Recombinant Glycoprotein Production

This detailed volume serves as a collection of methods for single-cell protein analysis, created by combining different protocols, taking advantage of new emerging technologies, and improving upon conventional methods to guide researchers aiming to perform protein analysis in single cells. Ranging

from simple to complex, conventional to the most current technologies, these chapters offer readers the ability to choose the best suited methodologies for them, based on the sample type and the available technologies or equipment. Written for the highly successful Methods in Molecular Biology series, chapters include introductions to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, and tips on troubleshooting and avoiding known pitfalls. Authoritative and practical, Single-Cell Protein Analysis: Methods and Protocols aims to help researchers utilizing single-cell protein analysis in their studies as well to inspire the development of the next generation of improved protein analysis methods in single cells.

Protein Electrophoresis

This volume presents detailed protocols for novel strategies and approaches to improve functional understanding of protein N- and C-terminal biology. Protein Terminal Profiling: Methods and Protocols addresses topics such as protease specificity profiling, N-terminal acetylation, assays to probe protease activity in cellular systems, protein N- and C-termini on a proteome-wide scale, and biochemical approaches to explain and examine extracellular protease activities. 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. “br>Cutting-edge and thorough, Protein Terminal Profiling: Methods and Protocols is a valuable resource for researchers that focus on biochemistry and cell biology, and those who share a broad interest in protein functionality and protein modifications.

Methods in Molecular Biology: Protein lipidation protocols

This book presents a collection of molecular biological methods specific to protein synthesis. Chapters open with a discussion of basic background information and strategy which is then complemented by comprehensive methodological details. The book is divided into seven significant areas that cover all of the research techniques required by both experienced researchers and newcomers to the field of protein synthesis, and will prove to be an invaluable reference source on the benchtop of many protein laboratories.

RNA-Protein Interaction Protocols

This detailed volume encompasses chapters from leading experts in the area of membrane proteins who describe step-by-step protocols developed these last few years to improve the functional production and stabilization of recombinant integral membrane proteins (IMPs). Membrane proteins play a key role in numerous pathologies such as cancer, cystic fibrosis, epilepsy, hyperinsulinism, and Alzheimer’s disease, yet studies on these and other disorders are hampered by a lack of information about the proteins involved. This book sets out to aid researchers in rectifying this situation. Written for the highly successful Methods in Molecular Biology series, chapters include introductions to their respective topics, lists of the necessary materials and reagents, readily reproducible laboratory protocols, and tips on troubleshooting and avoiding known pitfalls. Authoritative and up-to-date, Heterologous Expression of Membrane Proteins: Methods and Protocols, Second Edition serves as an ideal guide for scientists attempting to delve deeper into the myriad unique IMP structures.

Methods in Molecular Biology: protein purification protocols

Scientists across disciplines have increasingly come to recognize the power of the protein. Current Protocols in Protein Science, a two-volume looseleaf manual, was developed in response to this revitalized interest and provides the most comprehensive collection of expert protein methods available. The publication covers both basic and advanced methods used in protein purification, characterization, and analysis as well as post-translational modification and structural analysis. More than 800 basic, support and alternate protocols have been carefully chosen for maximum applicability. Carefully edited, step-by-step protocols replete with material lists, expert commentaries, and safety and troubleshooting tips ensure that you can duplicate the experimental results in your own laboratory. Quarterly updates, which are filed into the looseleaf, keep the set current with the latest developments in protein science methods. The initial purchase includes one year of updates and then subscribers may renew their annual subscriptions. Current Protocols publishes a family of laboratory manuals for bioscientists, including Molecular Biology, Immunology, Human Genetics, Cytometry, Cell Biology, Neuroscience, Pharmacology, and Toxicology.

Insoluble Proteins

This detailed volume provides in-depth protocols for protein labeling techniques and applications, with an additional focus on general background information on the design and generation of the organic molecules used for the labeling step. Chapters provide protocols for labeling techniques and applications, with an additional focus on general background information on the design and generation of the organic molecules used for the labeling step. 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 practical, Site-Specific Protein Labeling: Methods and Protocols provides a comprehensive overview on the most relevant and established labeling methodologies, and helps researchers to choose the most appropriate labeling method for their biological question.

Single-Cell Protein Analysis

This volume details basic and advanced protocols for both stages of protein engineering: the library design phase and the identification of improved variants by screening and selection. Chapters focus on enzyme engineering using rational and semi-rational approaches. Written in the highly successful Methods in Molecular Biology series format, chapters include introductions to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, and tips on troubleshooting and avoiding known pitfalls. Authoritative and cutting-edge, Protein Engineering: Methods and Protocols aims to aid scientists in the planning and performance of their experiments. The chapter 'Functional Analysis of Membrane Proteins Produced by Cell-Free Translation' is open access under a CC BY 4.0 license via link.springer.com.

Protein Terminal Profiling

This detailed volume explores the continuing techniques of studying RNA-protein complexes and interactions as research in these areas expand. After an introductory chapter, the book continues with ways to purify RNA-protein complexes assembled in cells or in isolated cellular extracts, methods for measuring various biochemical activities of RNA-interacting proteins or ribonucleoproteins, biochemical methods for measuring direct RNA-protein contact, as well as various new or innovative methods pertinent to the subject. Written for the highly successful Methods in Molecular Biology series, chapters contain brief introductions to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, and tips on troubleshooting and avoiding known pitfalls. Authoritative and up-to-date, RNA-Protein Complexes and Interactions: Methods and Protocols provides a set of useful protocols, both basic and advanced, designed to inspire researchers working with RNA and RNA-interacting proteins.

Adhesion Protein Protocols

This volume emphasizes new techniques to help understand protein cages and to apply them to a variety of technologies, highlighting the expertise of researchers based on three continents. Protein cages are currently inspiring diverse scientific disciplines and are therefore at the crossroads of extremely widely-scoped research, which is reflected in the detailed chapters of Protein Cages: Methods and Protocols. From nanomaterials studies and iron particles to computational strategies and Atomic Force Microscopy, the chapters herein collectively provide an introduction to the rich world of protein cage research and specific techniques to understand and exploit this fascinating class of proteins. Written in the highly successful Methods in Molecular Biology series format, chapters begin with an introduction to their respective topics, lists of the necessary materials, step-by-step, readily reproducible laboratory protocols, and tips on troubleshooting and avoiding known pitfalls. Practical and cutting-edge, Protein Cages: Methods and Protocols will help to inspire and further propel the current multi-disciplinary enthusiasm in studying and discovering new applications for protein cages.

Protein Synthesis

Exemplifying and illustrating recent exciting advances in PNA chemistry, the second edition of Peptide Nucleic Acids: Methods and Protocols serves as a vital complement to the first edition of the book. Since the discovery of peptide nucleic acids, many interesting new derivatives and analogues in terms of nucleic acid recognition specificity and affinity have emerged. Also, as this detailed volume presents,

great ingenuity in exploiting the unique properties of PNAs for a wide variety of applications within drug discovery, medical diagnostics, chemical biology and nanotechnology has unfolded. 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 key tips on troubleshooting and avoiding known pitfalls. Peptide Nucleic Acids: Methods and Protocols, Second Edition serves as a source of useful specific methods and protocols as well as a source of inspiration for future developments.

Heterologous Expression of Membrane Proteins

Current Protocols in Protein Science