Therapeutic Antibodies Methods And Protocols Methods In Molecular Biology

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Therapeutic Antibodies Methods And Protocols Methods In Molecular Biology ***2021-12-03***

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Bioconjugate Techniques Karger Publishers
Monoclonal Antibodies: Methods and Protocols, Second Edition expands upon the previous edition with current, detailed modern approaches to isolate and characterize monoclonal antibodies against carefully selected epitopes. This edition includes new chapters covering the key steps to generate high quality monoclonals via different methods, from antigen generation to epitope mapping and quality control of the purified IgG. Chapters are divided into four parts corresponding to four distinct objectives. Part I covers monoclonal antibody generation, Part II deals with monoclonal antibody expression and purification, Part III presents methods for monoclonal antibody characterization and modification, and Part IV describes selected applications of monoclonal antibodies. 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, Monoclonal Antibodies: Methods and Protocols, Second Edition provides crucial initial steps of monoclonal antibody generation and characterization with state-of-the art protocols.
Bioconjugation Humana Press
Over 2000 years ago in China, antibodies elicited by early forms of vaccination likely played a major role in the protection of the population from infectious agents. Vac- nation has been further developed in Europe and described by Edward Jenner in the late-eighteenth century, then successfully implemented worldwide. The idea to use theactiveingredientinthebloodofvaccinated(orimmunized)animalsorhumansfor the treatment of diseases came a century later. It was made possible by a series of discoveries,suchastherealizationthattheserumfromanimalsimmunizedwithtoxins, for example, diphtheria toxin or viruses, is an effective therapeutic against the disease causedbythesameagentinhumans. Inthe1880s,vonBehringdevelopedanantitoxin (anti-body) that did not kill the bacteria but neutralized the bacterial toxin. The first Nobel Prize in Medicine (1901) was given to him for the discovery of the serum therapy. Acenturylater,22monoclonalantibodies(mAbs)areapprovedbytheUnited States Food and Drug Administration (FDA) for clinical use, and hundreds are in clinicaltrialsforthetreatmentofvariousdiseasesincludingcancers,immunedisorders, and infections. The revenues from the top-five therapeutic antibodies reached $11. 7 billion in 2006, and major pharmaceutical companies raced to acquire antibody biotech companies with a recent example of MedImmune, Inc. , which was acquired for $15. 6 billion by AstraZeneca in 2007. This explosion of research and development in the field of therapeutic antibodies prompted the publication of the MiMB volume Therapeutic Antibodies: Methods and Protocols. The book’s major goal is to present a set of protocols useful for researchers discoveringanddevelopingtherapeuticantibodies. Currentadvancesandfuturetrends in the antibody therapeutics are analyzed in the lead-in review article.
Monoclonal Antibody Production Royal Society of Chemistry
The American Anti-Vivisection Society (AAVS) petitioned the National Institutes of Health (NIH) on April 23, 1997, to prohibit the use of animals in the production of mAb. On September 18, 1997, NIH declined to prohibit the use of mice in mAb production, stating that "the ascites method of mAb production is scientifically appropriate for some research projects and cannot be replaced." On March 26, 1998, AAVS submitted a second petition, stating that "NIH failed to provide valid scientific reasons for not supporting a proposed ban." The office of the NIH director asked the National Research Council to conduct a study of methods of producing mAb. In response to that request, the Research Council appointed the Committee on Methods of Producing Monoclonal Antibodies, to act on behalf of the Institute for Laboratory Animal Research of the Commission on Life Sciences, to conduct the study. The 11 expert members of the committee had extensive experience in biomedical research, laboratory animal medicine, animal welfare, pain research, and patient advocacy (Appendix B). The committee was asked to determine whether there was a scientific necessity for the mouse ascites method; if so, whether the method caused pain or distress; and, if so, what could be done to minimize the pain or distress. The committee was also asked to comment on available in vitro methods; to suggest what acceptable scientific rationale, if any, there was for using the mouse ascites method; and to identify regulatory requirements for the continued use of the mouse ascites method. The committee held an open data-gathering meeting during which its members summarized data bearing on those questions. A 1-day workshop (Appendix A) was attended by 34 participants, 14 of whom made formal presentations. A second meeting was held to finalize the report. The present report was written on the basis of information in the literature and information presented at the meeting and the workshop.
Therapeutic Antibodies Humana Press
This detailed book presents a technical overview and practical methodology of a variety of antibody array formats and technologies. As advantages and disadvantages of antibody array types are explored, the volume also delves into practical applications of antibody arrays pertaining to investigations of specific research topics and biological processes as well as guidance on the methods of processing, analysis, and storage of array data. 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 cutting-edge, Antibody Arrays: Methods and Protocols aims to empower the reader with the information required to select the most appropriate array for their research application, with the technical knowledge to use and process the array, and with the knowledge to perform analysis that realizes the maximum benefit from the data generated.
Therapeutic Monoclonal Antibodies Humana
The introduction of monoclonal antibodies revolutionized immunology. The development of human monoclonal antibodies was inspired primarily by the enormous clinical benefits promised by these reagents which can be used as anti-inflammatory reagents, anti-tumor reagents and reagents for passive immunization in a variety of pathologies. Human Monoclonal Antibodies: Methods and Protocols presents technical protocols of cellular and molecular methods for the production, purification and application of human monoclonal antibodies, as well as review articles on related topics of human monoclonal and polyclonal antibodies. 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 easily accessible, Human Monoclonal Antibodies: Methods and Protocols seeks to serve both professionals and novices with its well-honed methodologies which will prove invaluable in a clinical setting.
Human Monoclonal Antibodies Humana
A core collection of diverse cutting-edge techniques for the generation, expression, optimization, and characterization of recombinant antibodies. Readily reproducible protocols for lead generation range from the cloning of human immunoglobulin genes to the selection and generation of human recombinant antibodies by humanization approaches, molecular display technologies and transgenic animals. Procedures are also described on restructuring antibody leads into monovalent, multivalent, and bispecific binding fragments for a wide variety of in vivo applications. State-of-the-art technologies are described for the characterization of antigen-binding affinity and specificity with novel applications in radioimmunotargeting, cancer immunotherapy, drug abuse, and proteomics. Use cutting-edge techniques for generating and optimizing recombinant antibodies Generate antibodies by humanization, molecular display technologies and transgenic mice Perform epitope mapping with mass spectrometry, bioinformatics, and array technologies Learn about novel applications in cancer, drug addiction, and proteomics Express recombinant antibodies in bacterial, yeast, insect, mammalian and plant systems.
Antibody Production Therapeutic AntibodiesMethods and Protocols
Since the advent of hybridoma technology more than two decades ago, numerous antibodies have entered the clinical setting as potent therapeutic agents. Their repeated application in humans, however, is limited by the development of human antimouse antibodies (HAMA) in the recipient, leading to allergic re- tions against the foreign murine protein and rapid neutralization. To circumvent these limitations many new antibodies have recently been tailored through recombinant antibody technology. The initial clinical data show encouraging results, thus demonstrating the potential of these new therapeutic agents. The purpose of Recombinant Antibodies for Cancer Therapy is to present a collection of detailed protocols in recombinant antibody technology. It is pri- rily addressed to scientists working on recombinant antibodies as well as cli- cians involved with antibody-based therapies. As with other volumes of this series, we placed the main focus on providing detailed protocols describing procedures step-by-step. Moreover, each protocol supplies a troubleshooting guide containing detailed information on possible problems and hints for pot- tial solutions. Antibody technology is a subject of constant and rapid change. This volume, therefore, does not attempt to cover all possible current experimental approaches in the field. Rather, we present carefully selected protocols, written by competent authors who have successfully verified the particular method described. Given our own professional backgrounds and interest in oncology, we chose to conc- trate chiefly on therapeutic agents for cancer patients.
Antibody Engineering Humana Press
Antibody-drug conjugates (ADCs) represent a promising therapeutic approach for cancer patients by combining the antigen-targeting specificity of monoclonal antibodies (mAbs) with the cytotoxic potency of chemotherapeutic drugs. In Antibody-Drug Conjugates, expert researchers provide detailed protocols for many of the key ADC techniques necessary for working in the field. These chapters and methodologies are aimed at the key tasks necessary to identify a suitable target, properly design the mAb, the linker and the payload, as well as to conjugate them in a reproducible and scalable fashion. Written in the highly successful Methods in Molecular Biology format, these detailed chapters include the kind of practical implementation advice that guarantees quality results. Authoritative and timely, Antibody-Drug Conjugates aims to further drive ADC development and thus help toward improving cancer treatments of the future.
Glycosylation Engineering of Biopharmaceuticals Humana
Antibody–drug conjugates (ADCs) represent one of the most promising and exciting areas of anticancer drug discovery. Five ADCs are now approved in the US and EU [i.e., ado-trastuzumab emtansine (KadcylaTM), brentuximab vedotin (AdcetrisTM), inotuzumab ozogamicin (BesponsaTM), gemtuzumab ozogamicin (MylotargTM) and moxetumomab pasudotox-tdfk (Lumoxiti®)] and over 70 others are in various stages of clinical development, with impressive interim results being reported for many. The technology is based on the concept of delivering a cytotoxic payload selectively to cancer cells by attaching it to an antibody targeted to antigens on the cell surfaces. This approach has several advantages including the ability to select patients as likely responders based on the presence of antigen on the surface of their cancer cells and a wider therapeutic index, given that ADC targeting enables a more efficient delivery of cytotoxic agents to cancer cells than can be achieved by conventional chemotherapy, thus minimising systemic toxicity. Although there are many examples of antibodies that have been developed for this purpose, along

with numerous linker technologies used to attach the cytotoxic agent to the antibody, there is presently a relatively small number of payload molecules in clinical use. The purpose of this book is to describe the variety of payloads used to date, along with a discussion of their advantages and disadvantages and to provide information on novel payloads at the research stage that may be used clinically in the future.

Monoclonal Antibodies Humana Press

This book describes, in detail, tested techniques for the produc-tion and use of monoclonal antibodies. It covers those aspects of interest to all scientists working with monoclonal antibodies and presents methods in a step-by-step format for easy refer-ence. The text serves as a laboratory manual; and discusses rationale behind each method, and the choices between methods. It also provides a rational basis where several alternative methods are available.

Methods and Protocols Newnes

Antibodies are the body's major defense against disease. Antibody production is now a rapidly developing area where the uses of polyclonal and monoclonal antibodies are finding wide application. This book presents background information on the principles of antibody biology and production but, more importantly, it also provides direct practical help for researchers in choosing the most effective protocols for their research, both the classical methods of antibody production and purification, and recombinant technologies.

Antibody Arrays Academic Press

The exquisite binding specificity of antibodies has made them valuable tools from the laboratory to the clinic. Since the description of the murine hybridoma technology by Köhler and Milstein in 1975, a phenomenal number of mo- clonal antibodies have been generated against a diverse array of targets. Some of these have become indispensable reagents in biomedical research, while others were developed for novel therapeutic applications. The attractiveness of an- bodies in this regard is obvious—high target specificity, adaptability to a wide range of disease states, and the potential ability to direct the host’s immune s- tem for a therapeutic response. The initial excitement in finding Paul Ehrlich’s “magic bullet,” however, was met with widespread disappointment when it was demonstrated that murine antibodies frequently elicit the human anti-murine an- body (HAMA) response, thus rendering them ineffective and potentially unsafe in humans. Despite this setback, advances in recombinant DNA techniques over the last 15–20 years have empowered the engineering of recombinant antibodies with desired characteristics, including properties to avoid HAMA. The ability to p- duce bulk quantities of recombinant proteins from bacterial fermentation also fueled the design of numerous creative antibody constructs. To date, the United States Food and Drug Administration has approved more than 10 recombinant antibodies for human use, and hundreds more are in the development pipeline. The recent explosion in genomic and proteomic information appears ready to deliver many more disease targets amenable to antibody-based therapy.

Methods and Protocols National Academies Press

This volume covers current and emerging techniques for studying single-domain antibodies (sdAbs). Chapters guide readers through the biology and immunology of sdAbs in camelids and sharks, isolation of sdAbs, protein engineering approaches to optimize the solubility, stability, valency and antigen binding affinity of sdAbs, and specialized applications of sdAbs. 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, Single-Domain Antibodies: Methods and Protocols aims to be a useful, practical guide to help researchers further their studies in this field.

Therapeutic Antibodies Royal Society of Chemistry

Display technologies have become a very powerful way of generating therapeutic lead molecules and specific reagents for increasing our understanding of biology; however, despite being first described shortly after phage display, the use of ribosome display and related methods have been much less widespread. Since this is in part due to the complexity of the methods, Ribosome Display and Related Technologies: Methods and Protocols seeks to extend their use by collecting expert contributions describing these detailed protocols. The protocols described range from well-established methods that have been used for a decade to generate high affinity antibodies, which are already in the clinic, to methods that are in their early stages of application such as display of peptides incorporating non-canonical amino acids. Written in the highly successful Methods in Molecular BiologyTM 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. Invaluable and easy to use, Ribosome Display and Related Technologies: Methods and Protocols will be of great benefit to those with general molecular biology or protein engineering experience who wish to select peptides or proteins by display, those with phage display experience who would benefit from the application of ribosome display, as well as those with some ribosome display experience who would like to expand the range of applications to which they are applying the technology.

From Bench to Clinic Humana Press

The last decade has witnessed remarkable developments in antibody research and its therapeutic applications. With the methods of molecular biology it is now possible to manipulate the specificities and activities of antibody molecules to generate an almost limitless array of structures for both basic investigations and the clinical setting. The contributions to this volume cover all three domains of the antibody: the variable regions, the relatively neglected but crucial hinge, and the constant region. These studies provide critical structural and functional information about antibodies, while also pointing the way to the construction of molecules with enhanced or even novel properties. Bringing together major experts on antibody engineering, this book is highly recommended to faculty, postdoctoral fellows and graduate students in molecular biology, microbiology, immunology, cancer research and genetics.

Monoclonal Antibodies Humana

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. .

Methods and Protocols, Second Edition Humana Press

The formation of disulphide bonds is probably the most influential modification of proteins. These bonds are unique among post-translational modifications of proteins as they can covalently link cysteine residues far apart in the primary sequence of a protein. This has the potential to convey stability to otherwise marginally stable structures of proteins. However, the reactivity of cysteines comes at a price: the potential to form incorrect disulphide bonds, interfere with folding, or even cause aggregation. An elaborate set of cellular machinery exists to catalyze and guide this process: facilitating bond formation, inhibiting unwanted pairings and scrutinizing the outcomes. Only in recent years has it become clear how intimately connected this cellular machinery is with protein folding helpers, organellar redox balance and cellular homeostasis as a whole. This book comprehensively covers the basic principles of disulphide bond formation in proteins and describes the enzymes involved in the correct oxidative folding of cysteine-containing proteins. The biotechnological and pharmaceutical relevance of proteins, their variants and synthetic replicates is continuously increasing. Consequently this book is an invaluable resource for protein chemists involved in realted research and production.

Methods and Protocols Humana

The fourth edition of The Immunoassay Handbook provides an excellent, thoroughly updated guide to the science, technology and applications of ELISA and other immunoassays, including a wealth of practical advice. It encompasses a wide range of methods and gives an insight into the latest developments and applications in clinical and veterinary practice and in pharmaceutical and life science research. Highly illustrated and clearly written, this award-winning reference work provides an excellent guide to this fast-growing field. Revised and extensively updated, with over 30% new material and 77 chapters, it reveals the underlying common principles and simplifies an abundance of innovation. The Immunoassay Handbook reviews a wide range of topics, now including lateral flow, microsphere multiplex assays, immunohistochemistry, practical ELISA development, assay interferences, pharmaceutical applications, qualitative immunoassays, antibody detection and lab-on-a-chip. This handbook is a must-read for all who use immunoassay as a tool, including clinicians, clinical and veterinary chemists, biochemists, food technologists, environmental scientists, and students and researchers in medicine, immunology and proteomics. It is an essential reference for the immunoassay industry. Provides an excellent revised guide to this commercially highly successful technology in diagnostics and research, from consumer home pregnancy kits to AIDS testing. www.immunoassayhandbook.com is a great resource that we put a lot of effort into. The content is designed to encourage purchases of single chapters or the entire book. David Wild is a healthcare industry veteran, with experience in biotechnology, pharmaceuticals, medical devices and immunodiagnostics, which remains his passion. He worked for Amersham, Eastman-Kodak, Johnson & Johnson, and Bristol-Myers Squibb, and consulted for diagnostics and biotechnology companies. He led research and development programs, design and construction of chemical and biotechnology plants, and integration of acquired companies. Director-level positions included Research and Development, Design Engineering, Operations and Strategy, for billion dollar businesses. He retired from full-time work in 2012 to focus on his role as Editor of The Immunoassay Handbook, and advises on product development, manufacturing and marketing. Provides a unique mix of theory, practical advice and applications, with numerous examples Offers explanations of technologies under development and practical insider tips that are sometimes omitted from scientific papers Includes a comprehensive troubleshooting guide, useful for solving problems and improving assay performancee Provides valuable chapter updates, now available on www.immunoassayhandbook.com

Methods and Protocols Humana Press

More than ever, antibodies are being recognized as a major drug modality in a variety of diseases, including cancer, autoimmune diseases, infectious diseases, or even neurodegenerative disorders. Over 30 therapeutic antibodies have been approved and novel molecules are entering clinical trials at an average rate of 50 per year and that is predicted to continue well into the future. Notwithstanding the many achievements already made in the field, there is still a lot of room for improvements for these molecules in terms of activity, and a plethora of approaches have been attempted to optimize these molecules. Antibody Engineering: Methods and Protocols, Second Edition was compiled to give complete and easy access to a variety of antibody engineering techniques, starting from the creation of antibody repertoires and efficient ways to select binders from these repertoires, to their production in various hosts, their detailed characterization using various well established techniques, and to the modification and optimization of these lead molecules in terms of binding activity, specificity, size, shape, and more. Written in the successful Methods in Molecular BiologyTM 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 easily accessible, Antibody Engineering: Methods and Protocols, Second Edition serves as an invaluable resource for both experts and those new to the field, and most of all as a source of inspiration for the creation of the antibodies of tomorrow.

Therapeutic Antibodies Wiley

The rapidly growing field of antibody research is the result of many advancing technologies allowing current developments to take advantage of molecular engineering to create tailor-made antibodies. Antibody Methods and Protocols attempts to provide insight into the generation of antibodies using in vitro and in vivo approaches, as well as technical aspects for screening, analysis, and modification of antibodies and antibody fragments. The detailed volume is focused on basic protocols for isolating antibodies and, at the same time, it selects a range of specific areas with the aim of providing guides for the overall process of antibody isolation and characterization as well as protocols for enhancing classical antibodies and antibody fragments. Written in the highly successful Methods in Molecular BiologyTM 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 easy to use, Antibody Methods and Protocols provides a broad and useful background to support ongoing efforts by novices and experts alike and encourages the development of new imaginative approaches to this vital area of study.