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Tumor Immunology and Immunotherapy

Autophagy in Immune Response: Impact on Cancer Immunotherapy focuses on the status and future directions of autophagy with respect to different aspects of its interaction with the immune system and immunotherapy. The book takes scientific research in autophagy a step further by presenting reputable information on the topic and offering integrated content with advancements in autophagy, from cell biology and biochemical research, to clinical treatments. This book is a valuable source for cancer researchers, oncologists, graduate students and several members of biomedical field who are interested in learning more on the relationship between autophagy and immunotherapies. Presents updated knowledge on autophagy at the basic level and its potential use in cancer treatment Offers the first book to cover autophagy at the interface of cell

biology, immunology and tumor biology Provides a wealth of information on the topic in a coherent and comprehensive collection of contributions by world renowned scientists and investigators

The Basics of Cancer Immunotherapy

- Volume is divided into four sections, allowing easy navagation for researchers and practicing physicians - Text includes clinical trials - Written by leaders in the field

Cancer Immunotherapy: Mechanisms of Cancer Immunity, Engineering Immune-Based Therapies and Developing Clinical Trials

A guide to state-of-the-art cancer immunotherapy in translational cancer research A volume in the Translational Oncology series, Immunotherapy in Translational Cancer Research explores the recent developments in the role that immunotherapy plays in the treatment of a wide range of cancers. The editors present key concepts, illustrative examples, and suggest alternative strategies in order to achieve individualized targeted therapy. Comprehensive in scope, Immunotherapy in Translational Cancer Research reviews the relevant history, current state, and the future of burgeoning cancer-fighting therapies. The book also includes critical information on drug development, clinical trials, and governmental resources and regulatory issues. Each chapter is created to feature: development of the

immunotherapy; challenges that have been overcome in order to scale up and undertake clinical trials; and clinical experience and application of research. This authoritative volume is edited by a team of noted experts from MD Anderson Cancer Center, the world's foremost cancer research and care center and: Offers a comprehensive presentation of state-of-the-art cancer immunotherapy research that accelerates the pace of clinical cancer care Filled with the concepts, examples, and approaches for developing individualized therapy Explores the breath of treatments that reflect the complexity of the immune system itself Includes contributions from a panel international experts in the field of immunotherapy Designed for physicians, medical students, scientists, pharmaceutical executives, public health and public policy government leaders and community oncologists, this essential resource offers a guide to the bidirectional interaction between laboratory and clinic immunotherapy cancer research.

Immuno-Oncology

Over the last decade, immuno-oncology has witnessed an astonishing pace of discovery and innovation translating into unprecedented successes in the clinical setting, arguably representing one of the most profound and transforming revolution in the history of cancer therapy. This book provides a concise and accurate outline of the main developments in major tumor types including melanoma, lung, breast, brain and renal cell cancers. In addition, transversal chapters that describe the

commonalities of some of the therapeutic strategies are provided to cover topics like immune checkpoint biology, T cell engineering or rational combination therapies. Each chapter has been authored by senior key opinion leaders in their respective fields to provide the most up-to-date view on cancer immuno-oncology. To reflect on the key translational aspect of immuno-oncology, all chapters are making explicit connections between basic science discoveries and the resulting translational therapeutic strategies. Immuno-Oncology will be an invaluable source of information for scientists interested in the translation of basic immunology into the clinical practice, as well as for clinician interested in deepening their knowledge of current and upcoming immune strategies in the fight against cancers.

Tumor Immunology and Immunotherapy - Molecular Methods

This book provides patients and their physicians (especially “non-oncologist” health care providers) with a clear and concise introduction to cancer immunotherapy, which, unlike traditional forms of cancer therapy, acts by boosting the patient’s own immune system to fight cancer. The unique features of cancer immunotherapy make its management, monitoring and side-effects different from those of traditional cancer therapy. Especially novel are the side effects of cancer immunotherapy, necessitating greater awareness for both patients and physicians in order to minimize complications of therapy. The patient-friendly, concise, easy-to-understand, and up-

to-date knowledge presented in this book will inform patients about the benefits and risks of cancer immunotherapy, and help them and their care providers to understand how immunotherapy would control their unique disease. Researchers and academic professionals in the field of cancer immunotherapy will also find clear and useful information to help them communicate with patients or address unresolved problems. Some key features of the book are: Expertise. All editors and authors are scientists and oncologists specializing in cancer immunotherapy, and are involved in scientific discovery from the early stage of immune-checkpoint inhibitors to today's daily patient care. Their insights, expertise and experience guarantee the high quality and authority in the science, medicine and practice of cancer immunotherapy. Patient-friendly. This book is written for cancer patients in order to meet their needs when considering immunotherapy. As an educational tool, this book will help the reader balance the risks and benefits based on both science and clinical facts, and therefore to make the best choice in receiving or withdrawing from immunotherapy. Disease Specificity. Cancer is a complicated disease involving multiple stages and pathology. Its response to immunotherapy is individualized and varies depending on cancer types. The authors' expertise in treating different types of cancers, including melanoma, lung, kidney, bladder, and lymphoma, provides disease-specific insights in applying immunotherapy to each disease.

General Principles of Tumor

Immunotherapy

There has been major growth in understanding immune suppression mechanisms and its relationship to cancer progression and therapy. This book highlights emerging new principles of immune suppression that drive cancer and it offers radically new ideas about how therapy can be improved by attacking these principles. Following work that firmly establishes immune escape as an essential trait of cancer, recent studies have now defined specific mechanisms of tumoral immune suppression. It also demonstrates how attacking tumors with molecular targeted therapeutics or traditional chemotherapeutic drugs can produce potent anti-tumor effects in preclinical models. This book provides basic, translational, and clinical cancer researchers an indispensable overview of immune escape as a critical trait in cancer and how applying specific combinations of immunotherapy and chemotherapy to attack this trait may radically improve the treatment of advanced disease. * Offers a synthesis of concepts that are useful to cancer immunologists and pharmacologists, who tend to work in disparate fields with little cross-communication * Drs Prendergast and Jaffee are internationally recognized leaders in cancer biology and immunology who have created a unique synthesis of fundamental and applied concepts in this important new area of cancer research * Summarizes the latest insights into how immune escape defines an essential trait of cancer * Includes numerous illustrations including: how molecular-targeted therapeutic drugs or traditional chemotherapy can be

combined with immunotherapy to improve anti-tumor efficacy; and how reversing immune suppression by the tumor can cause tumor regression

Cancer Immunology

This book focusing on the immunopathology of cancers is published as part of the three-volume Springer series Cancer Immunology, which aims to provide an up-to-date, clinically relevant review of cancer immunology and immunotherapy. Readers will find detailed descriptions of the interactions between cancerous cells and various components of the innate and adaptive immune system. The principal focus, however, is very much on clinical aspects, the aim being to educate clinicians in the clinical implications of the latest research and novel developments in the field. In the new edition of this very well received book, first published in 2015, the original chapters have been significantly updated and additional chapters included on, for example, current knowledge on the roles of T-helper cells and NK cells in tumor immunity, the part played by oncoviruses in the development of various cancers, and the applications of fluorescent in situ hybridization, bioluminescence, and cancer molecular and functional imaging. Cancer Immunology: A Translational Medicine Context will be of special value to clinical immunologists, hematologists, and oncologists.

Immunotherapy and The Regulatory Immune System in Blood Cancers: From Mechanisms to Clinical Applications

Translational Immunotherapy of Brain Tumors gives researchers and practitioners an up-to-date and comprehensive overview of the field. Chapters include adoptive immunotherapy, immunosuppression, CAR therapy of brain tumors, and dendritic cell therapy for brain tumors. Very few agents have been shown to be efficacious in the treatment of malignant gliomas. Recently, there have been a number of studies demonstrating the potential success of immunotherapy for brain tumors. Immunotherapeutics are becoming the most frequent drugs to be used in cancer therapy. These new breakthroughs, now approved by the FDA, are a part of multiple phase III international trials and ongoing research in malignant glioma, meaning that the information in this cutting-edge book will be of great importance to practitioners and researchers alike. Comprehensive overview, providing an update on immunology, translational immunotherapy, and clinical trials relating to malignant gliomas Edited by a prominent neurosurgeon with contributions by leading researchers in the field Ideal resource for researchers and practitioners interested in learning about mechanisms that use the immune system to treat brain tumors

Translational Immunotherapy of Brain Tumors

The interplay between tumors and their immunologic microenvironment is complex, difficult to decipher, but its understanding is of seminal importance for the development of novel prognostic markers and

therapeutic strategies. The present review discusses tumor-immune interactions in several human cancers that illustrate various aspects of this complexity and proposes an integrated scheme of the impact of local immune reactions on clinical outcome. Current active immunotherapy trials have shown durable tumor regressions in a fraction of patients. However, clinical efficacy of current vaccines is limited, possibly because tumors skew the immune system by means of myeloid-derived suppressor cells, inflammatory type 2 T cells and regulatory T cells (Tregs), all of which prevent the generation of effector cells. To improve the clinical efficacy of cancer vaccines in patients with metastatic disease, we need to design novel and improved strategies that can boost adaptive immunity to cancer, help overcome Tregs and allow the breakdown of the immunosuppressive tumor microenvironment.

Tumor Immunology and Cancer Vaccines

In this book, leading experts in cancer immunotherapy join forces to provide a comprehensive guide that sets out the main principles of oncoimmunology and examines the latest advances and their implications for clinical practice, focusing in particular on drugs with FDA/EMA approvals and breakthrough status. The aim is to deliver a landmark educational tool that will serve as the definitive reference for MD and PhD students while also meeting the needs of established researchers and healthcare professionals. Immunotherapy-based approaches are now inducing

long-lasting clinical responses across multiple histological types of neoplasia, in previously difficult-to-treat metastatic cancers. The future challenges for oncologists are to understand and exploit the cellular and molecular components of complex immune networks, to optimize combinatorial regimens, to avoid immune-related side effects, and to plan immunomonitoring studies for biomarker discovery. The editors hope that this book will guide future and established health professionals toward the effective application of cancer immunology and immunotherapy and contribute significantly to further progress in the field.

Immunopathology and Immunomodulation

Cancer Immunology is intended as an up-to-date, clinically relevant review of cancer immunology and immunotherapy. This volume focuses on the immunopathology and immunotherapy of organ cancers in detail. It clearly explains their immunology and describes novel immunotherapy for specific cancers, including pediatric solid tumors, hematologic malignancies, gastrointestinal tumors, skin cancers, bone and connective tissue tumors, central nervous system tumors, lung cancers, genitourinary tract tumors and breast cancers. In so doing, it builds on the previous two volumes in Cancer Immunology, placing basic knowledge on tumor immunology and immunotherapy into a clinical perspective with the aim of educating clinicians on advances in cancer immunology and the most recent approaches in the

immunotherapy of various tumors. This translational, clinically oriented book will be of special value to clinical immunologists, hematologists and oncologists.

The Breakthrough

Therapeutic cancer vaccines represent a type of active cancer immunotherapy. Clinicians, scientists, and researchers working on cancer treatment require evidence-based and up-to-date resources relating to therapeutic cancer vaccines. Vaccines for Cancer Immunotherapy provides a reference for cancer treatment for clinicians and presents a well-organized resource for determining high-potential research areas. The book considers that this promising modality can be made more feasible as a treatment for cancer. Chapters cover cancer immunology, general approaches to cancer immunotherapy, vaccines, tumor antigens, the strategy of allogeneic and autologous cancer vaccines, personalized vaccines, whole-tumor antigen vaccines, protein and peptide vaccines, dendritic cell vaccines, genetic vaccines, candidate cancers for vaccination, obstacles to developing therapeutic cancer vaccines, combination therapy, future perspectives and concluding remarks on therapeutic cancer vaccines. Introduces the feasible immunotherapeutic vaccines for patients with different types of cancer Presents the status of past and current vaccines for cancer treatment Considers advantages and disadvantages of different therapeutic cancer vaccines Looks at the combination of vaccines and other modalities, including immunotherapeutic and conventional

methods Analyzes obstacles to development of therapeutic cancer vaccines Gives a view on future perspectives in the application of therapeutic cancer vaccines

Oncoimmunology

A dramatic increase in knowledge regarding the molecular biology of brain tumors has been established over the past few years. In particular, recent new avenues regarding the role of microRNAs along with further understanding of the importance of angiogenesis, immunotherapy and explanations for the resistance of the tumors to radiation therapy have been developed. A discussion of certain surgical management issues including improvements in imaging along with issues concerning tumor induced epilepsy is included. It is hopeful that this new information will lead to efficacious treatment strategies for these tumors which remain a challenge. In this book, a review of the latest information on these topics along with a variety of new therapeutic treatment strategies with an emphasis on molecular targeted therapies is provided.

Immune Checkpoint Inhibitors in Cancer

Make optimal use of the latest personalized therapeutic strategies with Handbook of Targeted Cancer Therapy! This concise, practical oncology reference examines more than 140 targeted therapy agents for which clinical trial data are available, and explains when and how you can use them to most

effectively combat cancer. Approach clinical challenges from any direction with separate sections on Targets by Organ Site, Carcinogenesis from the Perspective of Targeted Therapy, Molecular Targets and Pathways, and Targeted Therapy Agents. Find information easily thanks to a color-coded format and an intuitive organization. Access the complete contents online and on mobile devices, with regular updates to include newly approved treatments. Important state of the art cancer information for caregivers, researchers, other health care professionals, and even patients

Tumor Immunology and Immunotherapy - Cellular Methods Part B

Clinicians, patients and scientists, alike, have been battling cancer for over several decades; however, patient outcomes have not significantly improved over the years with conventional therapies. In recent years, this has caused researchers to look for a change in the status quo, and, the awareness of the human immune system, which has an intrinsic mechanism to control microbial pathogens and dysfunctional self-tissues, has triggered scientists to look for new modes of cancer therapy. Cancer Immunotherapy has become a major research field as a result of these efforts, gaining some recognition for notable breakthroughs in cancer patient prognosis. Frontiers in Cancer Immunology collectively presents the methods which have been studied and used in cancer immunotherapy based on the different components of human immune system. The series will

give clinicians and immunologists a roadmap of current trends in all branches of cancer immunology. This volume lists the major immune system components (such as T cells and NK cells and associated antigens/antibodies) which have been demonstrated to limit the growth of or kill tumor cells. Relevant applications in cancer therapy are also included in addition to a general introduction to engineered as well as targeted cancer immunotherapies (cancer vaccines).

Molecular Considerations and Evolving Surgical Management Issues in the Treatment of Patients with a Brain Tumor

Get a quick, expert overview of the latest clinical information and guidelines for cancer checkpoint inhibitors and their implications for specific types of cancers. This practical title by Drs. Fumito Ito and Marc Ernstoff synthesizes the most up-to-date research and clinical guidance available on immune checkpoint inhibitors and presents this information in a compact, easy-to-digest resource. It's an ideal concise reference for trainee and practicing medical oncologists, as well as those in research. Discusses the current understanding of how to best harness the immune system against different types of cancer at various stages. Helps you translate current research and literature into practical information for daily practice. Presents information logically organized by disease site. Covers tumor immunology and biology; toxicities associated with immune checkpoint

inhibitors; and future outlooks. Consolidates today's available information on this timely topic into one convenient resource.

Handbook of Targeted Cancer Therapy

This timely book, published just as cancer immunotherapy comes of age, summarizes the rationale, present status, and future perspective for cancer immunotherapy. Included are explanations of the constitution of the immune system and immunocheckpoints, the mechanism of antigen presentation and recognition, valuable modalities, clinical trials and guidance, personalization, and biomarkers, all of which are essential for understanding the success of cancer immunotherapy. This innovative therapy has been investigated worldwide as the fourth line of cancer treatment after the standard treatments of surgery, chemotherapy, and radiotherapy. The progress in fundamental understanding of tumor immunology and the recent advances in clinical trials have opened new avenues with a cancer vaccine in 2010 and immunocheckpoint modulation in 2011, with their approval already granted in the United States. Today, there are no doubts, even among experts in cancer chemotherapy and radiotherapy, that the immune system plays a vital role in tumor eradication. Following American approval, many clinical trials of cancer immunotherapy are being conducted. With this book the reader will readily understand the paradigm shift in cancer treatment and will realize the importance of cancer immunotherapy. The great value of

immunotherapy will be obvious, not only for tumor shrinkage but for prolonging patient survival.

Cancer Immunotherapy

For some time immunotherapy has been heralded as a breakthrough approach for cancer treatment. Although the potential of this strategy remains solid, the approach needs considerable refinement. Whilst some programmes are looking to increase the understanding of molecular and cellular mechanisms underlying the stimulation of antitumor immunity, others are trying to find the most appropriate clinical setting that will reveal the role of the immune system in combating cancer. Among the most important discoveries have been tumor-specific antigens. This thematic volume highlights some key issues and discusses where they may move forward. It has been put together by two leading cancer immunotherapists from two eminent institutions that focus on cancer research.

Cancer Immunotherapy

We acknowledge the initiation and support of this Research Topic by the International Union of Immunological Societies (IUIS). We hereby state publicly that the IUIS has had no editorial input in articles included in this Research Topic, thus ensuring that all aspects of this Research Topic are evaluated objectively, unbiased by any specific policy or opinion of the IUIS.

Harnessing Oncolytic Virus-mediated Antitumor Immunity

This translational book describes in detail the clinical application of novel approaches in cancer immunotherapy with the aim of educating clinicians in the implications of the most recent research and new developments in the field. The scope is broad, encompassing, for example, prognostic biomarkers for personalized cancer treatment, strategies for targeting tumor immunosuppression, gene therapy, virus-based vaccines, targeting of cancer stem cells, hematopoietic stem cell transplantation, the role of T lymphocytes in cancer immunotherapy, use of monoclonal antibodies, and many more innovative approaches. Clinical immunologists, hematologists, and oncologists in particular will find the book to be of value in expanding their knowledge. The book is the second in a three-volume series, Cancer Immunology, which offers an up-to-date review of cancer immunology and immunotherapy. The remaining volumes focus on the immunopathology of cancers and cancer immunotherapy for organ-specific tumors. In total the series, designed for both clinicians and researchers, includes contributions from more than 250 scientists working at leading universities and institutes from across the world.

Innate Immune Regulation and Cancer Immunotherapy

This book brings together the world’s leading authorities on tumor immunology. This book describes

the basic immunology principles that form the foundation of understanding how the immune system recognizes and rejects tumor cells. The role of the innate and adaptive immune responses is discussed and the implications of these responses for the design of clinical strategies to combat cancer are illustrated.

Role of Metabolism in Regulating Immune Cell Fate Decisions

Tumor Immunology and Immunotherapy - Cellular Methods Part B, Volume 632, the latest release in the Methods in Enzymology series, continues the legacy of this premier serial with quality chapters authored by leaders in the field. Topics covered include Quantitation of calreticulin exposure associated with immunogenic cell death, Side-by-side comparisons of flow cytometry and immunohistochemistry for detection of calreticulin exposure in the course of immunogenic cell death, Quantitative determination of phagocytosis by bone marrow-derived dendritic cells via imaging flow cytometry, Cytofluorometric assessment of dendritic cell-mediated uptake of cancer cell apoptotic bodies, Methods to assess DC-dependent priming of T cell responses by dying cells, and more. Contains content written by authorities in the field Provides a comprehensive view on the topics covered Includes a high level of detail

Cancer Immunology and Immunotherapy

Immunotherapy is an innovative, leading and valuable approach to the treatment and control of many

diseases. It can solve many problems of public health worldwide. Many people in numerous countries are suffering from a wide range of diseases (communicable and non-communicable) that can be cured or controlled by the immune system and immunotherapy. Some immunological diseases (i.e. allergic reactions and asthma, autoimmune disease, immunodeficiency disease, hypersensitivity reactions, etc.) have immune response pathophysiology and by controlling immune system mechanisms, these diseases can be controlled and cured. Immunoregulatory Aspects of Immunotherapy focuses on immune system mechanism, diagnosis, treatment and other related problems. The chapters have applicable and scientific data in immunotherapeutic approaches based on medical sciences, and would be of benefit to all researchers in immunology, allergy and asthma fields. The book discusses the prevention, diagnosis, treatment and follow-up of patients who have dangerous diseases. We hope this book will be a new approach to the immunotherapy of diseases and will improve public health and wellbeing.

Advances in Tumor Immunology and Immunotherapy

Innate and adaptive immunity play important roles in immunosurveillance and tumor destruction. However, increasing evidence suggests that tumor-infiltrating immune cells may have a dual function: inhibiting or promoting tumor growth and progression. Although regulatory T (Treg) cells induce immune tolerance by suppressing host immune responses against self- or

non self-antigens, thus playing critical roles in preventing autoimmune diseases, they might inhibit antitumor immunity and promote tumor growth. Recent studies demonstrate that elevated proportions of Treg cells are present in various types of cancers and suppress antitumor immunity. Furthermore, tumor-specific Treg cells can inhibit immune responses only when they are exposed to antigens presented by tumor cells. Therefore, Treg cells at tumor sites have detrimental effects on immunotherapy directed to cancer.

Immunotherapy in Translational Cancer Research

This book is a continuation of the efforts of InTech to expand the scientific know-how in the field of immunopathology and bring valuable updated information to medical professionals and researchers. It consists of chapters related to various approaches to investigate the unique role of the immune system in response to different clinical disorders. The international team of authors is the bonus of the book, reflecting the rapid development of immunology and new achievements in medical science. We firmly hope that the book will be an excellent manual and guideline for people dealing with biology, microbiology, immunology, virology, pharmacology, general and dental medicine, and health care, from students and postdocs to high-level specialists and university professors.

Tumor Immunology

Advances in Immunology, a long-established and highly respected publication, presents current developments as well as comprehensive reviews in immunology. Articles address the wide range of topics that comprise immunology, including molecular and cellular activation mechanisms, phylogeny and molecular evolution, and clinical modalities. Edited and authored by the foremost scientists in the field, each volume provides up-to-date information and directions for the future. This volume focuses on tumor immunology. Contributions from leading authorities Informs and updates on all the latest developments in the field

Tumor Immune Microenvironment in Cancer Progression and Cancer Therapy

The tumor microenvironment has become a very important and hot topic in cancer research within the past few years. The tumor microenvironment is defined as the normal cells, molecules, and blood vessels that surround and feed a tumor cell. As many scientists have realized, studying the tumor microenvironment has become critical to moving the field forward, since there are many players in a tumor's localized and surrounding area, which can significantly change cancer cell behavior. There is a dual relationship wherein the tumor can change its microenvironment and the microenvironment can affect how a tumor grows and spreads. Tumor Microenvironment in Cancer Progression and Cancer Therapy aims to shed light on the mechanisms, factors, and mediators that are involved in the cancer

cell environment. Recent studies have demonstrated that in addition to promoting tumor progression and protecting tumor cells from the spontaneous immune-mediated rejection and different forms of cancer therapeutics, tumor microenvironment can also be a target and mediator of both standard and newly-emerging forms of cancer therapeutics. Thus, the dual role of the tumor microenvironment is the integral focus of the volume. The volume highlights the bi-directional interactions between tumor cells and non-malignant tumor component during tumor progression and treatment. It also focuses on the three groups of the reactive tumor component: stromal cells, blood vessels and the infiltrating immune cells. These three groups are discussed under the lens of their role in promoting tumor growth, shielding the tumor from rejection and from standard forms of cancer therapies. They are emerging as targets and mediators of standard and new forms of potential therapy.

Cancer Immunology

Patients are beginning to benefit from antibody based, cellular and vaccine approaches that are effective against genetically diverse and therapy-resistance cancers. BCG immunotherapy is now being used as a first line treatment for human bladder cancer and the introduction of prophylactic vaccination against Hepatitis B and HPV cancers is starting to show positive results. Following recent FDA approval for a vaccination against prostate cancer, and optimistic results in clinical trials for a vaccine

targeting cancer antigens in lung cancer, cancer immunotherapy is now significantly impacting patient clinical management. Tumor Immunology and Immunotherapy provides an up-to-date and comprehensive account of cancer immunity and immunotherapy. It discusses our adaptive and innate immunity to cancer, the mechanisms underpinning our immune response, current approaches to cancer immunotherapy, and how tumour and host responses can circumvent effective anti-cancer immunity. The book examines recent results, publications and current areas of interest including 'immune editing' and the specific issues that are affecting the research and development of vaccines, providing insight into how these problems may be overcome, as viewed by world leaders in the field. Tumor Immunology and Immunotherapy will appeal to clinicians working in oncology and cancer immunotherapy, and research scientists including PhD and masters students, post-doctoral researchers and senior investigators.

Clinical Tumor Immunology

Metabolism of glucose, lipids, amino acids, and nucleotides represents the fundamental capability of host to utilize distinct nutrients and energy to support diverse function of different cell lineages. Cancer cells undergo the Warburg Effect to adapt to the microenvironment composed by stromal cells and immune cells. The crosstalk among cancer cells and immune cells orchestrate tumor progression. In the tumor microenvironment, immune cells also show metabolic reprogramming. For example, naive or

memory T cells switch from the oxidation of fatty acids to glycolysis and glutaminolysis after activation; meanwhile massive glucose and glutamine are transported into cells to meet their metabolic demands. Defective glucose or glutamine metabolism impairs the differentiation and expansion of helper T cells. The molecular pathways that control immune cell metabolism and function are intimately linked. Understanding such metabolic reprogramming of immune cells in the tumor microenvironment could offer new directions in manipulation of peripheral immune responses. Recent findings in immune cell metabolism hold the promising possibilities by metabolic manipulation of immune cells towards clinical therapeutics for treating cancer. This Research Topic includes updated findings and views in the metabolism of cancer cells and immune cells in the tumor microenvironment.

Metabolism of Cancer Cells and Immune Cells in the Tumor Microenvironment

Over the past decades, systems biology approaches have been applied in different areas of life science research including oncology. Researchers now understand the hallmarks of cancer cells such as abnormal cell growth, inflammation, dysregulated metabolic pathways and drug resistance properties at a molecular level. Systems biology approaches have enabled researchers to investigate cancer immunology by identifying cancer related biomarkers on immune cells, and to study the effect of different therapies in tissue cultures and mouse models.

Systems Biology in Cancer Immunotherapy explains the scope of systems biology in understanding the immune response to neoplasms. The book introduces readers to the concepts crucial to cancer immunology before delving into the applied systems biology topics such as the metabolic pathways in cancer cells, the biomolecular roles of signal transduction molecules and their respective biochemical pathways ad cancer immunotherapy. A brief conclusion at the end also provides some information from a clinical and commercial perspective on cancer immunotherapy. This volume is intended as an introductory reference for life science and medical students, researchers and academics interested in the application of systems biology to the immune system in oncology research and chemotherapy practice.

Immunoregulatory Aspects of Immunotherapy

Recent advances in understanding of fundamental immunology have created new insights into the dynamic interactions between tumors and the immune system. This includes new understanding of T- and B-cell interaction, immune inhibitory mechanisms including the biology of T regulatory cells, myeloid suppressor cells, and dendritic cell subsets. Enhanced understanding of mechanisms underlying T-cell anergy such as arginine deprivation, immunosuppressive cytokines, defective innate and interferon response pathways, and NKG2D downregulation have all provided new insight into suppression of anti-tumor immunity and tumor

evasion. In addition to emerging understanding of tumor evasion, new immune targets such as CTLA4 blockade, NK stimulatory receptors, manipulation of the antigen processing and presentation, cytokine and costimulatory responses all provide new possibilities for enhancing anti-tumor immunity even in tumors previously felt to be resistant to immune attack. Several of these strategies have already been realized in the clinic. The volume will explore evolving paradigms in antigen presentation, dendritic cell biology, the innate response and immunosuppressive mechanisms, and emerging strategies for manipulation of the immune system for therapeutic benefit that have realized success in neuroblastoma, leukemia, melanoma, lung cancer, and allogeneic transplantation. Early successes as well as failures will be highlighted to provide a snapshot of the state of clinical immunotherapy with an eye to future possibilities such as combination therapies, adoptive T-cell transfer, and the retargeting of immune cells via T-cell receptor engineering.

Immunotherapy of Cancer

Oncolytic viruses (OVs) have emerged as a promising anticancer treatment. OVs selectively infect, replicate in, and kill tumor cells. Oncolytic viral therapy occurs in two phases: an initial phase where the virus mediates direct oncolysis of tumor cells, and a second phase where an induced post-oncolytic immune response continues to mediate tumor destruction and retards progression of the disease. For a long time, the therapeutic efficacy was thought to depend

mainly on the direct viral oncolysis based on their tumor selective replication and killing activities. But the post-oncolytic anti-tumor activity induced by the OV therapy is also a key factor for an efficient therapeutic activity. The topic adresses various strategies how to optimize OVs anti-tumor activity.

Systems Biology in Cancer Immunotherapy

Tumor Immunology and Immunotherapy - Integrated Methods Part A

Immune Checkpoint Molecules and Cancer Immunotherapy

Follow along as this New York Times bestselling author details the astonishing scientific discovery of the code to unleashing the human immune system to fight in this "captivating and heartbreaking" book (The Wall Street Journal). For decades, scientists have puzzled over one of medicine's most confounding mysteries: Why doesn't our immune system recognize and fight cancer the way it does other diseases, like the common cold? As it turns out, the answer to that question can be traced to a series of tricks that cancer has developed to turn off normal immune responses -- tricks that scientists have only recently discovered and learned to defeat. The result is what many are calling cancer's "penicillin moment," a revolutionary discovery in our understanding of

cancer and how to beat it. In The Breakthrough, New York Times bestselling author of The Good Nurse Charles Graeber guides readers through the revolutionary scientific research bringing immunotherapy out of the realm of the miraculous and into the forefront of twenty-first-century medical science. As advances in the fields of cancer research and the human immune system continue to fuel a therapeutic arms race among biotech and pharmaceutical research centers around the world, the next step -- harnessing the wealth of new information to create modern and more effective patient therapies -- is unfolding at an unprecedented pace, rapidly redefining our relationship with this all-too-human disease. Groundbreaking, riveting, and expertly told, The Breakthrough is the story of the game-changing scientific discoveries that unleash our natural ability to recognize and defeat cancer, as told through the experiences of the patients, physicians, and cancer immunotherapy researchers who are on the front lines. This is the incredible true story of the race to find a cure, a dispatch from the life-changing world of modern oncological science, and a brave new chapter in medical history.

Cancer Immunotherapy Principles and Practice

This 1996 volume reviewed advances in the field of human tumour immunology for an audience of clinicians and researchers.

Autophagy in Immune Response: Impact

on Cancer Immunotherapy

Clinical Tumor Immunology contains the proceedings of the Symposium of Clinical Tumor Immunology held in Brussels, Belgium, on May 26-29, 1975) and organized by the European Organization for Research on Treatment of Cancer in cooperation with the Department of Immunology of the University Hospital of Brussels. The papers explore progress in the field of clinical tumor immunology and cover topics ranging from general mechanisms in tumor immunity to tumor antigens and immunotherapy. A classification of leukemias and lymphomas is also presented. Comprised of 48 chapters, this book begins with an overview of the biological activities of the circulating thymic hormone, followed by a discussion on macrophage secretions affecting the growth of other cells. The reader is then introduced to immune cellular mechanisms at the site of the tumor; the use of the leukocyte migration technique in studies of tumor-directed cellular immunity in malignant melanoma; and immunological approaches to the identification of leukemic cells. Subsequent chapters deal with preclinical approaches in tumor immunochemotherapy; mediation of immune responses to human tumor antigens with "immune" RNA; and the role of transfer factor in human cancer. This monograph will be of interest to oncologists and immunologists.

Tumor Immunology

Cancer Immunotherapy Principles and Practice, from

the Society of Immunotherapy of Cancer (SITC), is the authoritative reference on cancer immunobiology and the immunotherapy treatments that harness the immune system to combat malignant disease. Featuring five sections and over 50 chapters covering the Basic Principles of Tumor Immunology, Cancer Immunotherapy Targets and Classes, Immune Function in Cancer Patients, Disease Specific Treatments and Outcomes, and Regulatory Aspects of Cancer Immunotherapy, this book covers all major topics that have shaped the development of immunotherapy and propelled it to its current place at the forefront of cancer treatment innovation. This volume is a comprehensive resource for oncologists and fellows, immunologists, cancer researchers, and related practitioners seeking understanding of the basic science and clinical applications of cancer immunotherapy. As well as presenting the evidence for immune-based cancer treatment, it positions immunotherapy in the context of other available cancer treatments and provides data on response rates, risks, and toxicities across a variety of diseases. Filled with detailed tables, and instructive illustrations, as well as key points for quick reference, Cancer Immunotherapy Principles and Practice simplifies a challenging and dynamic subject. Key Features: Clearly summarizes the basic principles and research supporting cancer immunotherapy clinical translation Contains expert guidance and treatment strategies for all immunotherapy classes and agents, including cell-based therapies, monoclonal antibodies, cytokine therapies, checkpoint inhibitors, oncolytic viruses, adjuvant approaches, and treatment combinations Includes expert perspectives from

leading authorities in the field Provides information on all FDA-approved immunotherapies, including clinical management and outcome data Discusses clinical aspects of immunotherapy for individual cancer types, including melanoma and other skin cancers, lung cancers, gynecologic cancers, gastrointestinal cancers, hematologic cancers, genitourinary cancers, head and neck cancers, sarcomas, brain and other CNS cancers, breast cancer, and pediatric malignancies. Explains regulatory aspects behind the development and approval of immunotherapy drugs Includes Online Access to the Digital Book

Vaccines for Cancer Immunotherapy

This new volume of Methods in Enzymology continues the legacy of this premier serial with quality chapters authored by leaders in the field. Authority of the authors Comprehensiveness of the book Level of details

Cancer Immunology

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