

M.H. Kosco-Vilbois (Ed.)

# An Antigen Depository of the Immune System: Follicular Dendritic Cells



Springer

# Antigen Depository Of The Immune System Follicular Dendritic Cells

**Kenneth I. Berns, Catherine Giraud**



## **Antigen Depository Of The Immune System Follicular Dendritic Cells:**

**An Antigen Depository of the Immune System: Follicular Dendritic Cells** Marie H. Kosco-Vilbois, 1995-08-16

Follicular dendritic cells (FDCs) are unique among cells of the immune system. While their morphological characteristics resulted in their inclusion as a dendritic cell type, they differ quite significantly from the other members of the dendritic cell family. In contrast to T cell associated dendritic cells or the Langerhans cells found in the skin, FDCs reside in highly organized B cell follicles within secondary lymphoid tissues. This site of residence provided a nomenclature committee in 1982 with the second descriptive factor for the derivation of their name. The cardinal feature of FDCs is to trap and retain antigen on the surface of their dendritic processes for extended amounts of time and it is this feature that provides the conceptual component for the title of this book. In response to an antigenic challenge, primary B cell follicles undergo dynamic events giving rise to germinal centers which are associated with activation, expansion and differentiation processes of B cells. The interactions of B cells with FDCs and T cells in the germinal centers are essential for generating the complete repertoire of antibody isotypes obtained during an antibody response. In addition, stimuli either initiated or maintained during the germinal center response leads to production of high affinity antibodies through the processes of somatic mutation and clonal selection. In this context, FDCs act as a pivotal source of antigen. They accumulate foreign proteins, e.g.

**An Antigen Depository of the Immune System: Follicular Dendritic Cells** Marie H. Kosco-Vilbois, 2012-12-06

Follicular dendritic cells (FDCs) are unique among cells of the immune system. While their morphological characteristics resulted in their inclusion as a dendritic cell type, they differ quite significantly from the other members of the dendritic cell family. In contrast to T cell associated dendritic cells or the Langerhans cells found in the skin, FDCs reside in highly organized B cell follicles within secondary lymphoid tissues. This site of residence provided a nomenclature committee in 1982 with the second descriptive factor for the derivation of their name. The cardinal feature of FDCs is to trap and retain antigen on the surface of their dendritic processes for extended amounts of time and it is this feature that provides the conceptual component for the title of this book. In response to an antigenic challenge, primary B cell follicles undergo dynamic events giving rise to germinal centers which are associated with activation, expansion and differentiation processes of B cells. The interactions of B cells with FDCs and T cells in the germinal centers are essential for generating the complete repertoire of antibody isotypes obtained during an antibody response. In addition, stimuli either initiated or maintained during the germinal center response leads to production of high affinity antibodies through the processes of somatic mutation and clonal selection. In this context, FDCs act as a pivotal source of antigen. They accumulate foreign proteins, e.g.

[Dendritic Cells in Fundamental and Clinical Immunology](#) Paola Ricciardi-Castagnoli, 2013-11-11

These proceedings contain selected contributions from the participants to the Fourth International Symposium on Dendritic cells that was held in Venice Lido, Italy from October 5 to 10, 1996. The symposium was attended by more than 500 scientists coming from 24 different countries. Studies on dendritic cells (DCs) have

been greatly hampered by the difficulties in preparing sufficient cell numbers and in a reasonable pure form At this meeting it has been shown that large quantities of DC can be generated from precursors in both mice and humans and this possibility has enormously encouraged studies aimed to characterize DC physiology and DC specific genes and to employ DC therapeutically as adjuvants for immunization The possibility of generating large numbers of autologous DC that can be used in the manipulation of the immune response against cancer and infectious diseases has tremendously boosted dendritic cell research and the role of DC in a number of medical areas has been heatedly discussed

**Dendritic Cells in Fundamental and Clinical Immunology** Jacques Banchereau, Daniel Schmitt, 2012-12-06 These Proceedings contain the contributions of the participants of the Third International Symposium on Dendritic Cells that was held in Annecy France from June 19 to June 24 1994 This symposium represented a follow up of the first and second international symposia that were held in Japan in 1990 and in the Netherlands in 1992 Dendritic cells are antigen presenting cells and are found in all tissues and organs of the body They can be classified into 1 interstitial dendritic cells of the heart kidney gut and lung 2 Langerhans cells in the skin and mucous membranes 3 interdigitating dendritic cells in the thymic medulla and secondary lymphoid tissue and 4 blood dendritic cells and lymph dendritic cells veiled cells Although dendritic cells in each of these compartments are all CD45 leukocytes that arise from the bone marrow they may exhibit differences that relate to maturation state and microenvironment Dendritic cells are specialized antigen presenting cells for T lymphocytes they process and present antigens efficiently in situ and stimulate responses from naive and memory T cells in the paracortical area of secondary lymphoid organs Recent evidence also demonstrates their role in induction of tolerance By contrast the primary and secondary B cell follicles contain follicular dendritic cells that trap and retain intact antigen as immune complexes for long periods of time The origin of follicular dendritic cells is not clear but most investigators believe that these cells are not leukocytes

**Antigen Presentation** J. Lindsay Whitton, 2013-03-07 Antigen presentation is central to the immune response and is instrumental in ensuring that the response mounted is that best suited to the eradication of the particular microbe faced In this volume experts in the field provide state of the art descriptions of the antigen presentation pathways How do viruses disrupt these critical pathways and to what effect Do all tissues present antigen in the same way If not why What are the consequences of dysfunctional antigen presentation seen in certain genetic disorders This book considers not only the molecular details but also their relevance to the whole organism

**Follicular Dendritic Cells in Normal and Pathological Conditions** Ernst Heinen, 1995 This book covers different aspects of follicular dendritic cells their morphological phenotypic and functional features their origin relationship to B and T cells and their involvement in pathological conditions These data are extensively presented in eleven chapters well illustrated and written by specialists New unpublished results are given for example in addition to B cells T cells also divide in contact with follicular dendritic cells Follicles are thus not only nests for B cell proliferation but also provide stimuli for T cell multiplication and selection

**Specificity, Function, and Development of NK Cells** Klas Kärre, Marco Colonna, 2012-12-06 Our understanding of the function of natural killer NK cells has dramatically changed in recent years The discovery of NK receptors specific for MHC class I molecules and the study of the role of co stimulatory and adhesion molecules have led to an understanding of how NK cells recognize tumor and virally infected cells that have lost expression of MHC class I molecules or have altered distribution of normal cell surface molecules Such recognition events lead to intracellular signals which can be either stimulatory or inhibitory This book provides an insight into how NK cells develop how they learn to distinguish altered cells from normal cells and into their biological role in controlling infections and tumors *Reproductive Immunology* Lars B. Olding, 2012-12-06 Discrimination of self from nonself is the major function of the immune system and understanding the mechanisms involved a main employer of immunologists Hence the age old puzzle of why a fetus that contains a panel of major histocompatibility MHC antigens derived from its mother and its father is not rejected spontaneously aborted by lymphocytes from its mother who should theoretically recognize foreign MHC molecules from the father has remained of great interest This dilemma has enticed immunologists and developmental biologists for many years This volume was created to present the information currently on hand in this subject to the scientific public The guest editor Professor Lars Olding has a long and distinguished history of contributions in this field having been one of the main proponents of the argument that lymphocytes from the fetus play an active role in this process by suppressing lymphocytes from the mother from proliferating and thereby acting as killer cells His work has defined the phenomenon and identified suppressor molecules factors involved in the process In a different but related chapter Margareta Unander extends such observations to the clinical study of women with repeated habitual mIS carriages *The Hepatitis C Viruses* C.H. Hagedorn, C.M. Rice, 2012-12-06 Chronic hepatitis C is a major worldwide health problem affecting more than 170 million people Chronic infections lead to cirrhosis and liver failure or hepatocellular cancer in many instances This volume includes comprehensive reviews that cover much of the vast literature that has appeared since the identification of the hepatitis C virus RNA genome It will be an invaluable collection for anyone wanting an up to date picture of HCV transmission molecular virology immune response cellular molecular pathogenesis and possible avenues for developing effective new therapeutics and vaccines **Combinatorial Chemistry in Biology** Michael Famulok, Ernst-L. Winnacker, Chi-Huey Wong, 2013-06-29 The essence of combinatorial chemistry or techniques involving molecular diversity is to generate enormous populations of molecules and to exploit appropriate screening techniques to isolate active components contained in these libraries This idea has been the focus of research both in academia and in the pharmaceutical or biotechnology industry Its developments go hand in hand with an exploding number of potential drug targets emerging from genomics and proteomics research When the editors of Current Topics in Microbiology and Immunology encouraged us to assemble the present volume on Combinatorial Chemistry in Biology we immediately felt that this might prove quite beneficial for the audience of this series The field of combinatorial chemistry

extends over a broad range of disciplines from synthetic organic chemistry to biochemistry from material sciences to cell biology Each of these fields may have its own view on this topic something which is reflected in a growing number of monographs and special editions of journals devoted to this issue or aspects thereof The title of the present volume of Springer Verlag's series suggests that it also has its own special focus And generally speaking this is not wrong we would even claim the special focus of this volume is on the immunologically relevant aspects of combinatorial chemistry

**Genetic Instability and Tumorigenesis** Michael B. Kastan, 2012-12-06 M B KASTAN Cancer is a disease resulting from alterations of cellular genes which cause phenotypic changes in somatic cells Usually when we think about genetic diseases we think about inheriting one or two abnormal genes from our parents and these gene abnormalities confer the disease phenotype In contrast in the majority of cancers no such inherited gene abnormalities can be identified which does not mean that they do not exist and there is no obvious family history suggesting an inherited disease The vast majority of genes which are altered in the cancer cells are not transmitted through the germ line but rather become abnormal in somatic cells sometime during the lifetime of the individual Thus the critical question which arises is how do these genetic changes occur in somatic cells Epidemiologic data suggest that exposure to environmental carcinogens contributes to the genesis of at least 80% of all human cancers DOLL and PETO 1981 Thus it is natural to suspect that the genetic changes in somatic cells which contribute to the transformed phenotype arise from DNA damage caused by such exposures Therefore understanding how cells respond to DNA damaging agents is likely to be an important component of our understanding of the genesis of human tumors

Toxoplasma gondii Uwe Gross, 2012-12-06 For years toxoplasmosis has been known as disease mostly affecting newborns Since immunocompromised patients AIDS present a high risk of reactivation of chronic toxoplasmosis this parasitic disease has gained increasing interest Besides presenting clinical and therapeutical concepts this volume provides current knowledge about genetics and immunology of *T. gondii* and the interaction with its host Since in vivo and in vitro models of toxoplasmosis exist and genetic manipulation has become possible this protozoan parasite has recently been accepted as a model for understanding the pathogenesis and persistence of other intracellular parasites The articles of the book comprise both reviewing current concepts and reporting on yet unpublished results of leading scientists in this field

*Adeno-Associated Virus (AAV) Vectors in Gene Therapy* Kenneth I. Berns, Catherine Giraud, 2012-12-06 Human gene therapy holds great promise for the cure of many genetic diseases In order to achieve such a cure there are two requirements First the affected gene must be cloned its sequence determined and its regulation adequately characterized Second a suitable vector for the delivery of a good copy of the affected gene must be available For a vector to be of use several attributes are highly desirable these include ability to carry the intact gene although this may be either the genomic or the cDNA form in a stable form ability to introduce the gene into the desired cell type ability to express the introduced gene in an appropriately regulated manner for an extended period of time and a lack of toxicity for the recipient Also of

concern is the frequency of cell transformation and in some cases the ability to introduce the gene into nondividing stem cells. Several animal viruses have been tested as potential vectors but none has proven to have all the desired properties described above. For example, retroviruses are difficult to propagate in sufficient titers, do not integrate into nondividing cells, and are of concern because of their oncogenic properties in some hosts and because they integrate at many sites in the genome and thus are potentially insertional mutagens. Additionally, genes introduced by retroviral vectors are frequently expressed for relatively short periods of time. A second virus used as a vector in model systems has been adenovirus. Ad

**Transcriptional Control of Cell Growth** Peggy J. Farnham, 2012-12-06 It is of critical importance to maintain an appropriate balance between proliferation and quiescence or differentiation throughout the lifespan of all animals. An important control point in this balance occurs in the G phase of the cell cycle. On the basis of environmental cues, a cell in G must decide whether to continue through the proliferative cycle and enter S phase where DNA replication occurs or to exit from the proliferative cycle into a nonreplicating state. Alterations in the mechanisms that normally control this decision can lead to cancer, cell death, or loss of differentiated cellular phenotypes. The identification of the E2F gene family of transcription factors has allowed a more complete understanding of how the cell maintains an appropriate proliferative state. This volume provides an up-to-date account of present reports concerning E2F as well as a framework for future investigations. E2F activity requires heterodimerization of two partners. Either partner can be one of several different transcription factors. E2F1, E2F2, E2F3, E2F4, or E2F5 can heterodimerize with either DP1 or DP2. Cellular promoters whose E2F sites mediate a link between transcription and proliferation drive genes whose products are required for DNA synthesis and genes that encode regulators of cell growth. A detailed analysis of the role that E2F family members play in transcription from these promoters is presented in the chapter by J. E. SLANSKY and P. J. FARNHAM. Reoviruses II Kenneth L.

Tyler, Michael B.A. Oldstone, 2012-12-06 Reoviruses are one of the most important viral groups for understanding the molecular and genetic basis for viral pathogenesis. These two volumes cover virtually all aspects of reovirus biology. Volume I begins with a review of reovirus structure; further chapters deal with functions of the reovirus structural proteins, the assembly of the genome, and reovirus mutants. Volume II reviews general mechanisms of reovirus persistent infection and cytopathic effects and then discusses reovirus-induced disease in specific organ systems, including the heart, nervous, and endocrine systems, liver, and biliary system, and intestine. Together, these two volumes provide a current and comprehensive review of the mammalian reoviruses. **Morphogenesis and Maturation of Retroviruses** Hans-Georg

Kräusslich, 2012-12-06 Retroviruses arguably belong to the most fascinating of all viruses because of their unusual and highly efficient mode of replication involving reverse transcription and integration of the viral genome and a complex system of transcriptional and posttranscriptional regulatory mechanisms. The importance of retroviruses as human and animal pathogens has also enhanced scientific and medical interest in this diverse group of viruses and has spurred an intensive

search for novel and improved antiviral agents More recently analysis of retroviral replication and in particular understanding the formation and composition of the virus particle has received additional attention because of the promise of retroviral vectors as vehicles for human somatic gene therapy Many recent advances have been made in our understanding of the molecular mechanisms governing assembly and release of infectious retrovirus particles This book attempts to summarize these recent developments and to provide an overview of our current knowledge on retrovirus particle formation The individual chapters of the book deal with specific steps in the pathway of retroviral morphogenesis and maturation starting at the time when the components of the virus have been synthesized within the infected cell and ending once the infectious virion has been released from the cell An introductory chapter provides a comparative description of the structure and morphology of various retroviruses

*Attempts to Understand Metastasis Formation II* Ursula Günthert, Walter Birchmeier, 2012-12-06 Within the last decade the molecular biology of tumor models has revealed the identification of several metastasis related molecules These volumes attempt to review the most recent approaches of their mechanisms regulation and way to treat their malignant alterations The first volume covers the presentation of proteases and inhibitors and their role in invasion of tumor cells also cell adhesion molecules and their interaction with the extracellular matrix In the second volume the regulation of tumor progression and angiogenesis by cytokines growth factors and motility factors is outlined The third volume deals with detection of micrometastases and therapeutic approaches such as immunotherapy gene therapy chemotherapy and surgical strategies to combat metastatic spread

*Attempts to Understand Metastasis Formation I* Ursula Günthert, Walter Birchmeier, 2012-12-06 In metastasis tumor cells disseminate from the primary lesion and home to secondary organs where they may remain dormant for a long time Metastasis formation is still the most feared manifestation for tumor patients and clinicians Although improvements have been made concerning earlier detection and specific therapy most of the cancer patients still die of distant metastases The purpose of these three volumes is to review the recent progress in molecular metastasis research and to attempt to further understand the biology of this multifocal process With respect to present day molecular biology the pioneers of metastasis research established the basic concepts of metastasis formation in the 1970s and 1980s namely clonal selection of metastatic cells heterogeneity of metastatic subpopulations organ specificity of metastasis and the importance of angiogenesis Fidler Kripke Nicolson Folkman and others In the 1980s and 1990s several of the molecules involved were identified and their network interactions elucidated These three volumes of Current Topics in Microbiology and Immunology compile the most recent developments on these metastasis related molecules their interactions regulation and ways to interfere with their action It became evident that metastasis related molecules are confined to distinct cellular compartments such as the extracellular space the cell membrane the cytoplasmic signalling network and the nuclear regulatory system For the complex metastatic cascade proteolysis and alterations in adhesive functions are the most obvious and thus one of the most thoroughly investigated

processes      **Immunology of Silicones** Michael Potter, Noel Rose, 2012-12-06 This issue of Current Topics in Microbiology and Immunology records the proceedings of a Workshop on the Immunology of Silicones held at the Natcher Conference Center National Institutes of Health Bethesda Maryland March 13 and 14 1995 A large number of investigators from North America and Europe met to discuss available data on how the immune system responds to silicones and related materials Some aspects of this field are controversial Nonetheless the meeting was marked by a civil and open exchange of scientific information and divergent interpretations reflecting the traditions of scientific communication Each invited participant was asked to submit an article summarizing his/her presentation Most of the papers are published as submitted with only editorial changes to conform with the guidelines given to each contributor or revisions to clarify aspects of the paper The papers should not be regarded as peer reviewed publications This preface will attempt to outline some of the immunological areas of investigation relating to silicones      Reoviruses I Kenneth L. Tyler, Michael B.A. Oldstone, 2013-04-17 Reoviruses are one of the most important viral groups for understanding the molecular and genetic basis for viral pathogenesis These two volumes cover virtually all aspects of reovirus biology Volume I begins with a review of reovirus structure further chapters deal with functions of the reovirus structural proteins the assembly of the genome and reovirus mutants Volume II reviews general mechanisms of reovirus persistent infection and cytopathic effects and then discusses reovirus induced disease in specific organ systems including the heart nervous and endocrine systems liver and biliary system and intestine Together these two volumes provide a current and comprehensive review of the mammalian reoviruses

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