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Heat shock proteins and immune system. Heat shock proteins (HSPs) such as HSP 60 (Hsp60), Hsp70, Hsp90, and gp96, have been reported to play important roles in antigen presentation and cross-presentation, activation of macrophages and lymphocytes, and activation and maturation of dendritic cells. HSPs contain peptide-binding domains that ….

Heat shock proteins and immune system - PubMed
Abstract. This chapter focuses on immunological effects of eukaryotic and microbial heat shock proteins (HSPs), with molecular weights of about 60, 70, and 90 kDa. The search for tumor-specific antigens resulted in the identification of HSPs. They have been found to elicit a potent anti-cancer immune response mediated by the adoptive and innate immune system.

Heat Shock Proteins in Immunity - PubMed
This article has been cited byother articles in PMC. Heat shock proteins (hsp) have attracted considerable attention from immunologists over the last 20 years, and their interest has evolved in three distinct phases. Initially hsp were investigated primarily as antigens, particularly when it was found that they were rather common targets of both the humoral and T cell-mediated responses to intracellular pathogens like mycobacteria.

Heat shock proteins and innate immunity
Heat shock proteins (HSPs) such as HSP 60 (Hsp60), Hsp70, Hsp90, and gp96, have been reported to play important roles in antigen presentation and cross?presentation, activation of macrophages and lymphocytes, and activation and maturation of dendritic cells. HSPs contain peptide?binding domains that bind exposed hydrophobic residues of substrate proteins.

Heat shock proteins and immune system - Tsan - 2009 ...
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2. Immune Properties of Heat Shock Proteins. Heat shock proteins (HSPs) are stress proteins whose synthesis is triggered by proteotoxic stresses such as heat shock [19, 20]. The dominant functions of the HSPs are the holding and folding of other intracellular proteins . The HSPs are thus classified among the molecular chaperones, a group of polypeptides that mediate intracellular protein quality control under both housekeeping and stressed situations.

Heat Shock Proteins, Autoimmunity, and Cancer Treatment
Metabolic stressors may modulate innate immunity also indirectly by inducing a heat shock response. This implies the production of stress proteins acting as danger signals for the innate immune system.

Metabolic Stress, Heat Shock Proteins, and Innate Immune ...
Heat-shock proteins can be secreted from immune cells or tumour cells by non-canonical secretion pathway, or leaderless pathway, because they do not have the leader peptide, which navigate proteins into endoplasmic reticulum. The non-canonical secretion can be similar to the one, which occurs for IL1 b, and it is induced by stress conditions.

Heat shock protein - Wikipedia
Heat Shock Proteins. Heat shock proteins (HSPs) are abundantly expressed in atherosclerotic lesions, and both HSPs and anti-HSP antibodies stimulate the production of pro-inflammatory cytokines. From: Psychoneuroimmunology (Fourth Edition), 2007. Related terms: Dendritic Cell; Peptide; Hsp70; Heat Shock; Apoptosis; Nested Gene; Mutation; Crustacea; Amphipoda

Heat Shock Proteins - an overview | ScienceDirect Topics
The anti-tumor immune response can be markedly enhanced by treatment with hyperthermia particularly in the fever range. In addition, the heat shock proteins (hsp) which are produced in abundant quantities in cells exposed to heat are potent immune modulators and can lead to stimulation of both the innate and adaptive immune responses to tumors.

How is the immune response affected by hyperthermia and ...
Furthermore, the induction of self heat shock protein immune reactivity can attenuate autoimmunity and delay transplant rejection, and heat shock proteins derived from tumours and pathogens can elicit specific, protective immunity. This review will focus on this rapidly evolving area of heat shock protein biology.

Heat shock proteins as regulators of the immune response ...
The heat shock transcription factors are then translocated into the nucleus where they bind with heat shock elements (HSE) and initiate the transcription of heat shock proteins like HSP27, HSP70, and HSP90. The HSPs are exported into the tumor microenvironment modulating the immune response against cancer cells.

Heat Shock Proteins in Cancer Immunotherapy
Heat shock proteins (HSPs) have shown to possess the capacity of inducing lasting protective immune responses in models of experimental autoimmune diseases. Especially mycobacterial HSP60 and HSP70 were shown to induce disease inhibitory IL-10-producing regulatory T cells in many different models.

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Heat Shock Proteins and Immune Response: 167: Kaufmann ...
Heat shock proteins (HSPs) are important molecules required for ideal protein function. Extensive research on the functional properties of HSPs indicates that HSPs may be implicated in a wide range of physiological functions including immune function.

Heat Shock Proteins and Regulatory T Cells
Heat shock proteins have also been shown to have keys roles in the immune response, and boosting immunity. They have been shown to activate antigen presenting cells, the cells that present viral proteins to our white blood cells to initiate an immune response (3).

Almost 30 years ago RITOSSA described a new puffing pattern in salivary gland chromosomes of Drosophila following heat shock. This was the first description of a heat shock response. For years, development in this field remained modest and it took another decade before the relevant gene products-the heat shock proteins (hsp's)-were made visible by TISSIERES and co-workers. Subsequently, progress advanced more rapidly and we can now state that studies on the heat shock response have contributed much to our understanding of various principles in molecular and cellular biology such as control of gene expression and regulation of protein translocation. More recently, the study of hsp's has converged with immunology. There are several reasons for this: The chaperone function of certain hsp's makes them particularly apt for central functions of immunity, including antigen presentation and immunoglobulin synthesis. Furthermore, an effective immune response is often caused or followed by stress situations as they arise during trauma, inflammation, transformation, infection, or autoimmune disease. Due to their abundance during stress, hsp's can provide prominent antigens in many of these situations. This volume contains 11 chapters written by well-known experts dealing with various facets of the fascinating liaison between hsp's and immunity. The particular relation of hsp's to the immune system may be best illustrated by their intimate association with the major histocompatibility gene complex. Still, as discussed by GONTHER, the relevance of this fact to our understanding of hsp functions in immunity remaif)s speculative.

This book provides the most up-to-date review on new mechanisms and provides exciting insights into how heat shock proteins modulate the hosts' immune response. Written by leaders in the field of heat shock protein immunobiology, the chapters systematically and in a step-wise fashion take the reader through the fascinating sequence of events by which heat shock proteins activate immune responses and provide answers as to its biological significance to the host.

Experts from around the world review the current field of the immunobiology of heat shock proteins, and provide a comprehensive account of how these molecules are spearheading efforts in the understanding of various pathways of the immune system. This one-stop resource contains numerous images to both help illustrate the research on heat shock proteins, and better clarify the field for the non-expert. Heat shock proteins (HSPs) were discovered in 1962 and were quickly recognized for their role in protecting cells from stress. Twenty years later, the immunogenicity of a select few HSPs was described, and for the past 30 years, these findings have been applied to numerous branches of immunology, including tumor immunology and immunosurveillance, immunotherapy, etiology of autoimmunity, immunotherapy of infectious diseases, and expression of innate receptors. While HSPs can be used to manipulate immune responses by exogenous administration, they appear to be involved in initiation of de novo immune responses to cancer and likely in the maintenance of immune homeostasis.

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Chaperokine, is a term that describes the unique function of extracellular heat shock protein (eHsp) as both chaperone and cytokine. The cellular consequence of binding and signaling of eHsp is the stimulation of a potent and long lasting immune response. eHsp induces a plethora of immune responses including the release of bioactive mediators like cytokines, chemokines, nitric oxide, apotogenic mediator, stimulation of the innate and adaptive immune response, migration and maturation of dendritic cells (DC) and the enhancement of natural killer cell-mediated cellular cytotoxicity. The book Chaperokine Activity of Heat Shock Proteins provides the most comprehensive review on contemporary knowledge on the chaperokine activity of heat shock proteins (HSP) in biology and medicine. Using an integrative approach to understanding the chaperokine activity of HSP, the contributors provide a synopsis of novel mechanisms, signal transduction pathways and how the principles of the chaperokine activity of HSP has been harnessed for therapeutic gain. To enhance the ease of reading and comprehension this book has been subdivided into various section, including; Section I, reviews current progress on our understanding of Immunological and Inflammatory Responses; Section II, evaluates the role of Physiological Responses and Section III, focuses the reader on the Therapeutic Approach. Key basic and clinical research laboratories from major universities, academic medical hospitals, biotechnology and pharmaceutical laboratories around the world have contributed chapters that review present research activity and importantly project the field into the future. The book is a must read for researchers, postdoctoral fellows and graduate students in the fields of Translational Medicine, Clinical Psychologists, Human Physiology, Zoologists, Botanists, Biotechnology, Molecular Medicine, Infectious Diseases Experts, Pathologists, Pharmaceutical Scientists and Researchers involved in Drug Discovery.

Heat shock proteins (HSP) have received ample interest by immunologists over recent years. Initially they were found to be dominantly immunogenic microbial antigens. The connection with inflammation was established when it was uncovered that T cells specific for these antigens have a crucial role in the induction and regulation of experimental arthritis. Since then, the raised presence of immunity to HSPs in virtually all conditions of inflammation, including autoimmune diseases, transplant rejection and atherosclerosis, has emphasised the critical significance of immunity to HSPs in inflammatory diseases.

Prokaryotic and Eukaryotic Heat Shock Proteins in Infectious Disease provides the most current review of the literature relating to the role and influence of heat shock (stress) proteins on the establishment, progression and resolution of infectious disease. Written by leaders in the field of heat shock proteins (HSP) and their biological and immunological properties, the contributors provide a fascinating insight into the complex relationship between, and the involvement of prokaryotic and eukaryotic HSP in disease states. It has been known for some considerable time that heat shock proteins from prokaryotic organisms are immunodominant molecules that are intimately involved in the induction of potential protective inflammatory responses, and this aspect of HSP biology is updated herein. In addition to regulating heat shock protein gene expression, the transcription factor HSF1 also appears to play an important role in regulating immune responses to infection. Heat shock proteins are now known to influence infectious disease processes in a number of diverse ways: they are involved in the propagation of prions, the replication and morphogenesis of viruses, and the resistance of parasites to chemotherapy. These proteins also appear to be important mediators of bacteria-host interactions and inflammation, the latter via interactions with cell surface molecules and structures such as Toll-like receptors and lipid rafts. Heat shock proteins can be expressed on the surface of infected cells, and this is likely to provide a target for the innate immune response. Elevated levels of circulating HSP are present in infectious diseases and these proteins might therefore regulate inflammatory responses to pathogenic challenge on a systemic basis. Heat shock proteins are also implicated in the impact of genital tract infections on the reproductive outcome, as well as in the local and systemic consequences of periodontal disease. Fever-range temperatures can induce the expression of heat shock proteins, and the final chapter in the book examines the influence of fever-range hyperthermia on a variety of cells and the organization of plasma membranes. This book is an essential read for graduates and postgraduates in Biology, pro- and eukaryotic Biochemistry, Immunology, Microbiology, Inflammatory and Infectious Disease, and Pathology.

Heat shock proteins are emerging as important molecules in the development of cancer and as key targets in cancer therapy. These proteins enhance the growth of cancer cells and protect tumors from treatments such as drugs or surgery. However, new drugs have recently been developed particularly those targeting heat shock protein 90. As heat shock protein 90 functions to stabilize many of the oncogenes and growth promoting proteins in cancer cells, such drugs have broad specificity in many types of cancer cell and offer the possibility of evading the development of resistance through point mutation or use of compensatory pathways. Heat shock proteins have a further property that makes them tempting targets in cancer immunotherapy. These proteins have the ability to induce an inflammatory response when released in tumors and to carry tumor antigens to antigen presenting cells. They have thus become important components of anticancer vaccines. Overall, heat shock proteins are important new targets in molecular cancer therapy and can be approached in a number of contrasting approaches to therapy.