Immunobiology Of Carbohydrates

REVIEWS

THE IMMUNOBIOLOGY OF SCHISTOSOMIASIS

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Schistosomes are parasitic worms that are a prime example of a complex multicellular pathogen that flourishes in the human host despite the development of a pronounced immune response. Understanding how the immune system deals with such pathogens is a daunting challenge. The past decade has seen the use of a wide range of new approaches to determine the nature and function of the immune response to schistosomes. Here, we attempt to summarize advances in our understanding of the immunology of schistosomiasis, with the bulk of the review reflecting the experimental focus on *Schistosoma mansoni* infection in mice.

DIGENETIC TREMATODE Digenetic trematodes, or flukes, are extremely successful parasitic worms, the life cycle of which requires development in at least two hosts. Importantly, they can parasitize all classes of vertebrate, causing widespread medical and economic problems.

T HELPER 1/T HELPER 2 (T_H1/T_H2). Subsets of $CD4^+$ T cells that are characterized by their cytokine production profiles. T_H1 cells primarily produce IFN-γ, and generally provide protection against intracellular pathogens, whereas T_H2 cells mainly produce IL-4, IL-5 and IL-13, and are important for immunity to helminth parasites.

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Schistosoma is a genus of parasitic DIGENETIC TREMATODES that chronically infects more than 200 million people in developing countries (BOX 1). The estimated mortality owing to *Schistosoma mansoni* and *Schistosoma haematobium* in sub-Saharan Africa is 280,000 per year[1]. Three early findings piqued the interest of immunologists in schistosomiasis: the immune response is intimately involved in the development of many of the pathological changes that accompany infection; infected individuals can have resistance to superinfection; and schistosomes survive for years in the host despite a strong immune response. More recently, interest in these parasites has increased owing to demonstrations that schistosome maturation and fecundity are, in some way, dependent on the host immune response. Schistosomes, like other parasitic helminths, induce marked T HELPER 2 (T_H2) responses, providing a model system for studying the development and function of this type of immune response.

Immune-related pathologies during infection

Schistosomiasis causes a range of morbidities, the development of which seems to be influenced to a large extent by the nature of the induced immune response and its effects on granuloma formation and associated pathologies in target organs[2,3] (FIG. 1; BOX 2). Field studies in endemic areas, combined with animal experiments, have led to the view that host genetics, infection intensity, *in utero* sensitization to schistosome antigen and co-infection status all influence the development of the immune response and, so, disease severity.

Two main clinical conditions are recognized in *S. mansoni*-infected individuals — acute schistosomiasis and chronic schistosomiasis.

Acute schistosomiasis: a T_H1 disease? Acute schistosomiasis in humans is a debilitating febrile illness (Katayama fever) that can occur before the appearance of eggs in the stool and which is thought generally to peak between 6 and 8 weeks after infection[4]. During acute illness, which is less well studied than chronic disease (see below), there is a measurable level of tumour-necrosis factor (TNF) in the plasma, and peripheral-blood mononuclear cells (PBMCs) produce large quantities of TNF, interleukin-1 (IL-1) and IL-6 (REF. 5). Notably, cytokine production by PBMCs after stimulation with parasite antigen reflects a dominant T HELPER 1 (T_H1); rather than T_H2, response[5]. Presumably, in the natural progression of the disease, the developing egg-antigen-induced T_H2 response downregulates the production and effector functions of these pro-inflammatory mediators (FIG. 1); the production of IL-10 during this period might have a crucial role in this process[6].

Anomalously, the febrile illness that is associated with the initial stages of schistosome infection seems to be uncommon in individuals who live in areas that are endemic for schistosomiasis. It occurs, instead, in individuals who have no previous history of exposure who

(1)Division of Immunology, Department of Microbiology and Carbohydrates as T cell-activating antigens have been generating significant.The relative lack of interest in immunology research on carbohydrate antigens has been due mainly to their inability to induce an adaptive.Immunobiology Of Carbohydrates (molecular Biology Intelligence Unit) eBay Mobile.Immunobiology of carbohydrates. by Simon Y C Wong; Gemma Arsequell i Ruiz;. Print book. English. Georgetown, Texas: Landes Bioscience ; New York.Immunobiology Of Carbohydrates PDF. IMMUNOBIOLOGY OF CARBOHYDRATES. Download PDF Ebook and Read OnlineImmunobiology Of Carbohydrates.Oligosaccharide epitopes in cell biology. Immunobiology of bacterial lipopolysaccharide (endotoxin). Carbohydrate mimetics as investigation tool in drug.immunobiology of carbohydrates. 1 2 3 4 5. Published September 30, Delivery Time 10 - 15 days. Binding hardback. Publisher springer science+ business.MICROREVIEW. DOI: /ejoc Carbohydrates and Immunology : Synthetic Oligosaccharide Antigens for. Vaccine Formulation.Abstract. Carbohydrates in the form of capsular polysaccharides and/or Keywords: Bacterial polysaccharides; Immunology; Present and future vaccines.c Division of Infectious Diseases and Immunology, Queensland Institute of Medical Keywords: lipids; carbohydrates; adjuvants; carriers; immunology.Decoupling of Carbohydrate Binding and MASP-2 Autoactivation in Variant .. Immunobiology of Carbohydrates Wiley-VCH, Weinheim.The Molecular Immunology of Complex Carbohydrates 2 (Advances in Experimental Medicine and Biology Vol.). edited by Albert M. Wu, Kluwer Academic.Immunobiology indicating that the reduction/oxidation state of cell surface carbohydrates is crucial for induction of inflammatory processes by T cells. Trapping.Immunology and Cell Biology focuses on the general functioning of the immune Characteristics of protein-carbohydrate interactions as a basis for developing.Division of Immunology, Department of Microbiology and In studies innovatively integrating structural carbohydrate chemistry, microbiology.Immunobiology Of Carbohydrates by Simon Y. C Wong; Gemma Arsequell. Carbohydrate recognition systems in autoimmunity. (1)Department of Genetics, Cell-.Synthetic carbohydrate wards off pneumococcal infections. March 20, Chemistry (M&T) Immunobiology Medicine. Innovative vaccines can provide better.