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BACTERIAL PRODUCT CANTASTIM DERIVED FROM PSEUDOMONAS AERUGINOSA INDUCES MIGRATION AND MATURATION OF DENDRITIC CELLS

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ABSTRACT

Dendritic cells (DCs) play a pivotal role in linking innate and adaptive immunity. Migration to the lymph nodes and maturation of DCs are crucial steps in the initiation of specific immune responses. The bacterial product CANTASTIM (CS) is a purified extract of Pseudomonas aeruginosa that induces non-specific protection against bacterial infection, enhances macrophage effector functions and modulates cytokines production. In this study, we used a mouse skin explant culture model and human monocyte-derived DCs to study the effect of CS on the migration and maturation of DCs, respectively. We noticed a significant increase in the number of DCs which migrated from the skin explants when CS was added to the culture medium. Also, CS was able to induce the expression of maturation-associated marker CD83 on human monocyte-derived DCs. DC-based tumor vaccines represent a promising approach for cancer immunotherapy and the migration rate and maturation state of DCs are important parameters for their clinical effectiveness. CS may be an attractive candidate to be tested for the production of DC-based vaccine.

Key words: dendritic cell, maturation, migration, CANTASTIM

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ABSTRACT

The aim of the study was to evaluate several mediators of inflammation in patients with aortic sclerosis in relation to severity of cardiovascular disease. Serum level of cytokines, soluble intracellular adhesion molecule 1, matrix metalloproteinase (MMP) 2 and 9 and their tissue inhibitor TIMP-1, were measured by ELISA and MMPs activity by zymography in 51 aortic sclerosis patients. The increase in MMPs expression positively correlated with their gelatinase activity; also there was a positive correlation between MMP-9 and TIMP-1 serum levels. Moreover, IL-6 concentration positively correlated with both serum level and activity of MMP-9. The level of IL-6 and IL-1Ra were higher in patients with a great burden of atherosclerosis. Noteworthy, statistically significant higher levels of IL-6 were noticed for patients with coronary artery disease. There was a significant increase in IL-6 serum level as well as a significant decrease in IL-1Ra for patients with a history of myocardial infarction. A trend toward higher concentration of inflammatory mediators was noticed in relation to the increase in severity of the aortic valve disease. Our results support the hypothesis of an "inflammatory pattern" associated with AS pathology and suggest the persistence of a chronic inflammation in patients who experienced acute coronary events.

Key words: aortic sclerosis; inflammation; cytokine; matrix metalloproteinase

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ADJUVANT PROPERTIES OF BACTERIAL PRODUCT CANTASTIM

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ABSTRACT

Aluminum compounds have been used as adjuvants in practical vaccination for more than 60 years to induce an early, an efficient and a long lasting protective immunity. Nowadays they are the most widely used adjuvants in both veterinary and human vaccines. Unfortunately these adjuvants do not only cause undesirable side effects, but often induce T-helper type 2 (Th2)-biased responses. In this study we investigated the ability of the bacterial product CANTASTIM (CS) to augment the immune responses to a model antigen, tetanus toxoid (TT). Immunization of mice with TT + CS elicited higher anti-TT IgG antibody levels as compared to mice that received TT alone. Moreover, treatment with TT + CS resulted in a lower IgG1/IgG2a ratio and a stronger in vitro IFN-γ synthesis by splenocytes and T cells cocultured with macrophages. These data suggest that CS can be used to enhance the magnitude of the immune response and to skew it towards the Th1 type.

Key words: CANTASTIM, adjuvant, tetanus toxoid, vaccines

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ABSTRACT

Guanylate kinase is a member of the nucleoside monophosphate (NMP) kinase family, a family of enzymes that despite having a low primary structure identity share a similar fold, which consists of three structurally distinct regions termed the CORE, LID, and NMP-binding regions. Guanylate kinase (GMPK) is an essential enzyme for the biosynthesis of GTP and dGTP by catalyzing the phosphoryl transfer from ATP to (d)GMP resulting in ADP and (d)GDP. Despite the similar fold of the monomer there is an important difference between GMPKs from prokaryotes and eukaryotes: eukaryotes GMPK are monomers while prokaryotes GMPK are dimmers, tetramers or hexamers. For this reason bacterial GMPKs are possible targets for new antibacterial drugs. Finding new targets for antibacterial therapies is a prior subject in today's medical research. The purpose of this work was to characterize guanylate kinases from both gram positive and gram negative pathogenic bacteria. We started with GMPK from Enterococcus faecalis as gram positive microorganism and Pseudomonas aeruginosa as gram negative representative.

Key words: guanylate kinase, DNA cloning, guanosine 5’-monophosphate, ATP regeneration, acyelovir, ganciclovir

CHARACTERIZATION OF GUANYLATE KINASE FROM GRAM POSITIVE AND GRAM NEGATIVE MICROORGANISMS; PRELIMINARY RESULTS

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ABSTRACT
As knowledge has accumulated on the blood-transmitted pathogenic agents, the contact with biological fluids (blood, plasma, saliva, etc) from apparently healthy individuals has started to be regarded as a real professional risk for dentists. Theoretically, exposure to a contaminated biological specimen may have as a consequence transmission of infection from patient to dentist, from dentist to patient and from patient to patient via inadequately decontaminated and sterilized dental equipment. The present study is concerned with the analysis of the specific conditions that favor the occurrence of the epidemic process, the estimation of the risk degree of transmission of infections caused by hepatitis B, C viruses as well as of HIV infection in Romania. The data for the study were collected using two processes. First a self reporting survey and secondly an experimental procedure were performed. The testing of dentists’ knowledge of blood transmissible diseases and infection control in their offices were performed using a questionnaire with 129 questions. The professional incidents/accidents representing a potential risk were counted using a questionnaire (with 37 questions). Serological markers were tested with ELISA kits. The monitoring of sterilization was accomplished with a questionnaire and biological tests. Many conclusions result from the study. There is an extremely reduced probability and infection transmission from the dentist to the patient. The transmission of infection from the patient to the dentist represents a low risk (for all that, the risk should not be minimized). The rigorous control and observation of infection prevention measures in dental offices is necessary to stop the infection transmission from patient to patient. The dentists’ postgraduate training in infection control measures should be completed with knowledge regarding the blood transmissible infections epidemiology. Learning more about the epidemiological process enables the dentists to avoid wrong attitudes and behaviors.

Key words: dentists, risk, blood transmission, prevention, attitude

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ABSTRACT

The human metapneumovirus (hMPV) was first isolated in 2001 in the Netherlands (Van der Hoogen and collaborators) from a nasopharyngeal aspirate sampled from an infant. Based on the morphological, biochemical and genetic characteristics, the hMPV was initially classified in the genus Metapneumovirus with the avian metapneumovirus (APV), the agent causing the respiratory infections of the upper tract in turkeys and other birds. Subsequently, together with the respiratory syncytial virus (RSV), it was classified in the Pneumovirus genus which is a part of the Pneumovirinae subfamily, the Paramyxoviridae family.

The aim of the present study was to optimize hMPV molecular detection and to detect the virus in samples form children with respiratory infections in Romania. Two types of RTPCR commercial kits were evaluated for the detection of hMPV.

Tests were performed on 28 pharyngeal exudates from children aged from 9 months to 6 years, which were negative for influenza viruses and for Respiratory Syncytial Virus (RSV). Among the tested samples 7 (25%) have been positive for hMPV by RT-PCR. These results document for the first time that hMPV is circulating in Romania and causes respiratory infections, especially in newborns and children under 6 years old.

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ABSTRACT

The urinary tract is among the most common sites of bacterial infection and E. coli is by far the most common infecting agent in children and adults of both sexes. In an attempt to evaluate the intrinsic virulence of E. coli uroisolates from children, 54 strains were assessed by using PCR for the presence of five representative genetic determinants coding for adherence systems (pap, sfa/foc, afa), and toxins (hly and cnf). The prevalence of pap, sfa/foc and afa genes was 55%, 54%, and 44%, respectively. Hemolysin-encoding gene hly was detected in 55% strains, while cnf was exhibited by 35% of the screened E. coli isolates. Among the 39 PCR positive strains isolated from children’s urine cultures the co-occurrence of the various targeted virulence genes was detected in 30 strains, the virulence profiles identified suggesting the presence of their localization on chromosomal regions known as pathogenicity-associated islands. The rapid and reliable detection of the intrinsic virulence potential by this molecular approach could be very useful when evaluating the importance of microorganism pathogenicity versus host’s susceptibility for developing an overt symptomatology of infection.

Key words: Escherichia coli, virulence gene, PCR detection
THE MAINTAINING OF THE ACTIVE LABORATORY-BASED SURVEILLANCE OF THE ACUTE FLACCID PARALYSIS (AFP) CASES IN ROMANIA
IN THE FRAMEWORK OF THE STRATEGIC PLAN
OF THE GLOBAL POLIO ERADICATION INITIATIVE

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ABSTRACT
Until 2008 poliomyelitis was controlled in Romania by predominantly using Oral Poliovirus Vaccine Sabin (OPV); the alternative vaccination schedule (IPV formalin Inactivated Poliovirus Vaccine / OPV) will be implemented starting September 2008. The vaccination coverage with 4 doses of TOPV (trivalent oral polio vaccine) in the first 14 months of life has been > 90 % since 1980. In Romania, the risk of the Vaccine-Associated Paralytic Poliomyelitis cases (VAPP) decreased from less than 2 VAPP cases/year in the 1995-2006 interval to 0 VAPP cases in 2007. The serological study was performed in 2006-2007 only in cases with pair serum samples from 28 acute flaccid paralysis (AFP) cases (age = 3 months - 14 years) and from 45 facial paralysis (FP) cases (age = 6 months - 9 years 9 months). A high level of vaccinal coverage was shown for all poliovirus serotypes: > 95% in AFP serum samples investigated; and for FP serum samples investigated the levels of antibodies against poliovirus (PV) serotypes were 98% for PV type 1; 87% for PV type 2; and 89% for PV type 3. If the European region is polio free since 2002, the risk of wild PV importation from endemic region remains present. The laboratory capacity for the fast detection and molecular investigations of the emergence of the new epidemic strains and a high level of population immunity must be maintained. A national seroprevalence study concerning all three PV serotypes must be performed.

Key words: poliomyelitis, Oral Poliovirus Vaccine, IPV formalin Inactivated Poliovirus Vaccine, Vaccine-Associated Paralytic Poliomyelitis

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