2013-08-04-061 Paratuberculosis databases updated (2013-08-02)

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New publications in the PARATUBERCULOSIS database (1473-1474)

1473 Molicotti, P., Scanu, A.M., Lumbau, A., Cannas, S., Bua, A., Luglie, P., Zanetti, S.

Molecular identification of Mycobacterium avium subspecies paratuberculosis in oral biopsies of Crohn's disease patients
Gut Pathogens, (2013) 5 , Article Number: 18 DOI: 10.1186/1757-4749-5-18 Published: JUL 10 2013
Oral lesions may be found in patients with Crohn's disease (CD), in a percentage up to 20%. The aim of this study was to investigate a possible relationship between Mycobacterium avium subsp. paratuberculosis (MAP) and oral lesions in CD patients. 23 oral biopsies were examined performing IS900 Nested PCR; 9 of them were positive: 8 from CD patients and 1 from a control. Our purpose is to go on with this study, amplifying the number of subjects examined and testing subjects with oral lesions related to diseases other than CD to verify the specific association between MAP and oral lesions in CD patients.

1474 Bradner, L., Robbe-Austerman, S., Beitz, D.C., Stabel, J.R.

Chemical Decontamination with N-Acetyl-L-Cysteine-Sodium Hydroxide Improves Recovery of Viable Mycobacterium avium subsp paratuberculosis Organisms from Cultured Milk
Journal of Clinical Microbiology, (2013) 51, 2139-2146
Mycobacterium avium subsp. paratuberculosis is shed into the milk and feces of cows with advanced Johne's disease, allowing the transmission of M. avium subsp. paratuberculosis between animals. The objective of this study was to formulate an optimized protocol for the isolation of M. avium subsp. paratuberculosis in milk. The parameters investigated included chemical decontamination with N-acetyl-L-cysteine-sodium hydroxide (NALC-NaOH), alone and in combination with antibiotics (vancomycin, amphotericin B, and nalidixic acid), and the efficacy of solid (Herrold's egg yolk medium [HEY]) and liquid (Bactec 12B and para-JEM) culture media. For each experiment, raw milk samples from a known noninfected cow were inoculated with 10(2) to 10(8) CFU/ml of live M. avium subsp. paratuberculosis organisms. The results indicate that an increased length of exposure to NALC-NaOH from 5 to 30 min and an increased concentration of NaOH from 0.5 to 2.0% did not affect the viability of M. avium subsp. paratuberculosis. Additional treatment of milk samples with the antibiotics following NALC-NaOH treatment decreased the recovery of viable M. avium subsp. paratuberculosis cells more than treatment with NALC-NaOH alone. The Bactec 12B medium was the superior medium of the three evaluated for the isolation of M. avium subsp. paratuberculosis from milk, as it achieved the lowest threshold of detection. The optimal conditions for NALC-NaOH decontamination were determined to be exposure to 1.50% NaOH for 15 min followed by culture in Bactec 12B medium. This study demonstrates that chemical decontamination with NALC-NaOH resulted in a greater recovery of viable M. avium subsp. paratuberculosis cells from milk than from samples treated with hexadecylpyridinium chloride (HPC). Therefore, it is important to optimize milk decontamination protocols to ensure that low concentrations of M. avium subsp. paratuberculosis can be detected.

New publications in the CROHN'S DISEASE AND PARATUBERCULOSIS database (820-823)

820 Molicotti, P., Scanu, A.M., Lumbau, A., Cannas, S., Bua, A., Luglie, P., Zanetti, S.

Molecular identification of Mycobacterium avium subspecies paratuberculosis in oral biopsies of Crohn's disease patients
Gut Pathogens, (2013) 5 , Article Number: 18 DOI: 10.1186/1757-4749-5-18 Published: JUL 10 2013
Oral lesions may be found in patients with Crohn's disease (CD), in a percentage up to 20%. The aim of this study was to investigate a possible relationship between Mycobacterium avium subsp. paratuberculosis (MAP) and oral lesions in CD patients. 23 oral biopsies were examined performing IS900 Nested PCR; 9 of them were positive: 8 from CD patients and 1 from a control. Our purpose is to go on with this study, amplifying the number of subjects examined and testing subjects with oral lesions related to diseases other than CD to verify the specific association between MAP and oral lesions in CD patients.

821 Wong, C.K., Hu, S.Q., Leung, K.M.L. , Dong, J., He, L., Chu, Y.J., Chu, I.M.T., Qiu, H.N., Liu, K.Y.P., Lam, C.W.K.

NOD-like receptors mediated activation of eosinophils interacting with bronchial epithelial cells: a link between innate immunity and allergic asthma
Cellular & Molecular Immunology, (2013) 10, 317-329
Key intracytosolic pattern recognition receptors of innate immunity against bacterial infections are nucleotide-binding oligomerization domain (NOD)-like receptors (NLRs). We elucidated the NOD1 and NOD2-mediated activation of human eosinophils, the principal effector cells for allergic inflammation, upon interacting with human bronchial epithelial BEAS-2B cells in allergic asthma. Eosinophils constitutively expressed NOD1,2 but exhibited nonsignificant responses to release chemokines upon the stimulation by NOD1 ligand gamma-D-glutamyl-meso-diaminopimelic acid (iE-DAP) and NOD2 ligand muramyl dipeptide (MDP). However, iE-DAP and MDP could significantly upregulate cell surface expression of CD18 and intercellular adhesion molecule (ICAM)-1 on eosinophils and ICAM-1 on BEAS-2B cells, as well as induce chemokines CCL2 and CXCL8 release in the coculture system (all $P<0.05$). Both eosinophils and BEAS-2B cells were the main source for CXCL8 and CCL2 release in the coculture system upon iE-DAP or MDP stimulation. Direct interaction between eosinophils and BEAS-2B cells is responsible for CCL2 release, and soluble mediators are implicated in CXCL8 release. ERK and NF-kappa B play regulatory roles for the expression of adhesion molecules and chemokines in coculture. Treatment with NOD1,2 ligand could induce the subepithelial fibrosis and significantly enhance the serum concentration of total IgE, chemokine CCL5 for eosinophils and T helper type 2 (Th2) cells and asthma Th2 cytokine IL-13 in bronchoalveolar lavage fluid of ovalbumin-sensitized allergic asthmatic mice (all $P<0.05$). This study provides further evidence of bacterial infection-mediated activation of NOD1,2 in triggering allergic asthma via the activation of eosinophils interacting with bronchial epithelial cells at inflammatory airway.

822 Shi, G.P., Vistica, B.P., Nugent, L.F., Tan, C.Y., Wawrousek, E.F., Klinman, D.M., Gery, I.

Differential Involvement of Th1 and Th17 in Pathogenic Autoimmune Processes Triggered by Different TLR Ligands
Journal of Immunology, (2013) 191, 415-423
The interaction between TLRs and their cognate ligands triggers both the innate and adaptive immune systems, and thus can play a pivotal role in the defense against pathogen invasion. This work investigates the differentiation of naive CD4 cells into Th1 or Th17 phenotypes in mice treated with different TLR ligands. We use a model system in which naive transgenic cells specific to hen egg lysozyme are adoptively transferred into recipients that express hen egg lysozyme in the lens of the eye. The transferred naive T cells induce ocular inflammation only in recipients treated with TLR ligands. Treatment with LPS preferentially stimulated IL-17

production, whereas CpG oligodeoxynucleotide and polyinosinic: polycytidylic acid primarily stimulated Th1 cells. Peptidoglycan stimulated the two Th subpopulations equally. The preferential induction of Th1 or Th17 by the four ligands was detected in the spleen (where a major portion of the adoptively transferred cells homed) and in the eyes, where activated Th cells initiate inflammation. Analysis of the cytokines present in recipient mice suggests that Th1 induction is elicited by IL-12 and/or IFN-alpha, whereas Th17 generation is preferentially mediated by IL-6. Importantly, we show in this article that treatment with LPS selectively promoted in the recipient mice the generation of IL-6-producing activated B cells. An inverse correlation was found between the level of regulatory T cells and severity of inflammation induced by the donor cells. Taken together, our data show that specific TLR ligands differentially activate the immune system as evidenced by the generation of distinct Th phenotypes from naive CD4 cells.

823 Johnson, J.L., Jones, M.B., Ryan, S.O., Cobb, B.A.

The regulatory power of glycans and their binding partners in immunity
Trends in Immunology, (2013) 34, 290-298
Glycans and glycan-binding proteins are central to a properly functioning immune system. Perhaps the best known example of this is the selectin family of surface proteins that are primarily found on leukocytes, and which bind to endothelial glycans near sites of infection or inflammation and enable extravasation into tissues. In the past decade, however, several other immune pathways that are dependent on or sensitive to changes in glycan-mediated mechanisms have been revealed. These include antibody function, apoptosis, T helper (Th)1 versus Th2 skewing, T cell receptor signaling, and MHC class II antigen presentation. Here, we highlight how regulated changes in protein glycosylation both at the cell surface and on secreted glycoproteins can positively and negatively modulate the immune response.

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