

Seminar

on

Intervention of bacterial and viral infection with probiotics

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Abstract :

A promising new paradigm for the treatment of infectious disease is through activation of the innate immune system rather than direct attack on the microbe. This strategy harnesses the natural power of immune responses and may minimize the likelihood of bacterial resistance as the attack is indirect, multi-faceted and evolutionarily successful. Through either physiological or therapeutic activation these responses can be rapidly induced and amplified to mediate potent and non-specific defense against microbial challenge. In this capacity, probiotics are among the leading candidates to control infection via induction of innate immune responses. We established two probiotics, *Bacillus clausii* (BC) and *Lactobacillus acidophilus* (LA) as potential intervening agents in vitro against bacterial and viral infections. We also established earlier transcriptional profile of selected innate immune genes in primary intestinal epithelial cells. Based on gene expression kinetics, a time point was chosen to prime epithelial cells with the probiotic prior to infection with rotavirus. Plaque assays and genomic analysis provided the basis for establishing the efficacy of probiotics in preventing a rotaviral infection. Plaque assays revealed that the probiotic is capable of decreasing (at least by 100-fold) levels of live virus when the cells were primed with the probiotic. Understanding of probiotic-induced regulatory gene expression and networking in vivo is critical to further explore their roles in controlling infection. We have recently initiated our in vivo studies with BC and LA in mice model to understand efficacy and mechanism of intervention. Our long term plan is to understand role of gut microbiome, in general, in controlling or inducing disease susceptibility with special emphasis on obesity and T2D.

Brief Biosketch:

Palok Aich is a physical biochemist turned molecular and systems biologist. His research interests are psychological stress, disease and mucosal immunity. He did his PhD in Biophysics from Saha Institute of Nuclear Physics, Kolkata followed by post doctoral research work in Stockholm University and Karolinska Institutet, Sweden and in the University of Saskatchewan, Canada. He then joined a pharmaceutical industry in Canada as a group leader of bio-imaging followed by a position in Vaccine and Infectious Disease Organization (VIDO), Canada as a scientist. In 2009 summer, he joined National Institute of Science Education and Research (NISER) as Associate Professor and become first chairperson of School of Biological Sciences. His contribution to science and society has offered him international and national awards such as Federation of European Biochemical Society (FEBS) young scientist, Canada Innovation Award, Ramalingaswami fellow as well as associate and managing editorship of international journals such as current bio-informatics, Frontiers of Bioscience.