Present thesis “An Experimental Study on Probiotic Effect of Sporeformers” is primarily focused on the isolation, characterization, selection and identification of potential probiotic isolate for in vivo analysis. Wild species of spore formers were selectively isolated from various sources like Dry spices, Milk, Soil, Intestine of Pig and Chicken. Probiotic potential of the isolates were studied on the basis of non hemolytic, and non lecithinase activity, acid and bile tolerance, resistance to artificial gastric and intestinal fluids and antagonistic action towards enteric pathogens such as Salmonella typhi (734) Salmonella paratyphi A (735), and Vibrio cholera (3906) obtained from MTCC Chandigarh. Spores of selected isolates, showed excellent resistance to acid and bile and the vegetative cells have not shown much challenging marks. Based on probiotic qualities five isolates named MBTU PBBM1, S-7, CD-4, CD-1 and CI-2 were further selected and their antagonistic principles were studied. Results revealed that none of these isolates produced siderophores. Antimicrobial substances produced by the isolates in their cell free supernatant varied with respect to the action of proteolytic enzymes, Trypsin, Pepsin, Proteinase K and α-Amylase. All the isolates were found to produce thermo labile antimicrobial compound except the isolate S-7. All the selected five isolates were further studied for adhesion properties. Compared to the pathogens, spores of the isolates were found to be more adhesive on intestinal mucous than vegetative cells. Both spores and vegetative cells were auto aggregating but autoaggregation of vegetative cells was found to be more than that of spores. Vegetative cells of isolates coaggregated the three pathogens while spores remained to be...
noncoaggregating. All five isolates and pathogens produced biofilm. In the case of enteric pathogens *Vibrio cholerae* registered a higher adhesion and cell surface properties than *Salmonella typhi*, *Salmonella paratyphi* A. Compared to enteric pathogens, MBTU PBBM1 possessed an enhanced adhesion and cell surface properties than other four isolates. Among the five isolates MBTU PBBM1 from milk showed remarkable probiotic and antagonistic properties. Biochemical and molecular identification studies revealed that MBTU PBBM1 showed more similarity towards *Bacillus subtilis* with the NCBI gene accession number JN873913. Assumption for growth suggested the out competing nature of the selected strain against the indicator pathogens, which is desirable for probiotic strains. The strain was found to be sensitive to all tested antibiotics except Methicillin. Plasmid cured strain of MBTU PBBM1 was Methicillin sensitive and antagonistic towards enteric pathogens. MBTU PBBM1 possessed health promoting effects such as bile salt deconjugation and cholesterol assimilation. Immunomodulatory studies also proved that the strain has a significant role in improving both humoral and cell mediated immunity. Immune responses and histopathological studies in immunocompromised mice showed that MBTU PBBM1 could potentially prevent and reverse immunosuppressive effects induced by cyclophosphamid. The above potentials of MBTU PBBM1 provide supportive information in considering the efficacy of this probiotic strain as nutraceutical as well as in probiotic therapy.

**Key Words:** Sporeformers, *Bacillus subtilis*, Milk, Immunomodulation, Cyclophosphamid, Balb/c mice