

Lactic acid bacteria as potential bio-therapeutic agents of type 2 Diabetes: Stimulation of incretin hormone and inhibition of DPP IV

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Incretins are a group gut hormones (GLP-1 and GIP) which play a key role in modulating insulin secretion. DPPIV is the primary enzyme which inactivates incretin hormones. Although prebiotics are well documented to enhance incretin levels, similar information with regard to probiotics is scarce. Hence, an attempt was made to explore *Lactobacillus* strains for their incretin hormone stimulation potential. STC-1pGIPNeo cells were co-cultured with live bacterial strains and the resulting media was analysed for incretin hormones alongwith their gene expression. DPPIV inhibitory activity of their heat killed preparations was determined by an *in vitro* fluorescent assay. Only three of the *Lactobacillus* isolates (Lb4, Lb6 and Lb9) and four of the reference strains (*L. acidophilus*, *L. casei*, *L. plantarum* and *L. rhamnosus*) significantly upregulated proglucagon expression by 3.1, 2.1, 1.2, 2.5, 1.7, 1.8 and 2.5 folds respectively. However, only Lb3, *L. johnsonii* and *L. rhamnosus* could stimulate GLP-1 secretion by 86 ± 6 , 60 ± 14 and 82 ± 45 pM/106cells/h respectively. In terms of GIP, three of the isolates Lb4, Lb6 and Lb9 along with *L. plantarum* and *L. rhamnosus* induced expression by 2.5, 2.6, 2.4, 3.1 and 5.3 folds respectively. Two of the isolates (Lb1 and Lb3) along with reference strains *L. johnsonii* and *L. rhamnosus* significantly stimulated GIP secretion by 1005 ± 50 , 1557 ± 431 , 3695 ± 1190 and 2857 ± 601 pM/106cells/h respectively. Modest DPPIV inhibition (~25%) was demonstrated with only Lb1, Lb2, Lb3, Lb4 and *L. paracasei*. The study indicates the prospect of using probiotics as modulators of incretin hormones which can be explored as potential bio-therapeutics against diabetes.

Biography

Harsh Panwar has recently (June 2013) completed his Ph.D. in Dairy Microbiology from National Dairy Research Institute, India and is presently working as Senior Research Fellow at Molecular Biology Unit of N.D.R.I., Karnal. He stood as Gold Medalist in Microbiology from Kurukshetra University Kurukshetra (INDIA). He has bagged prestigious DST INSPIRE Fellowship from Govt. of India and Commonwealth Scholarships for One year split site study at Queen's University Belfast from Commonwealth Scholarship Commission (UK). He is author and co-author in more than 6 papers in reputed journals in field of Probiotics and Diabetes.

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