**Title: Reduced growth level of *Enterococcus faecalis* on arginine containing media is restored and altered the cellular physiology and metabolism upon acquisition of pediocin resistance**


## Abstract

*Enterococcus faecalis* is Gram-positive, opportunistic pathogen causes several nosocomial infections and has evolved as a highly adapted strain for various environmental habitats. *E. Faecalis* exhibits adaptation for arginine as an alternative energy source under glucose limitation for their survival and to continue cellular processes as well. The results of the present study reveal that *E. faecalis* is not able to achieve the maximum growth level on arginine. However, in the presence of pediocin-PA1 during resistance acquision *E. faecalis* restore the growth level in arginine-containing chemically defined media as achieved with glucose. IC50 of *E. faecalis* grown in the presence of pediocin was higher than *E. Faecalis* grown on its absence. The Km/Vmax values of the enzymes of ADI pathway were found low during resistance acquisition against pediocin than its absence. Hampered pediocin activity by utilizing arginine was accountable during resistance acquisition. Higher encapsulated biofilm formation along with surface hydrophobicity and up-regulation of genes; dltA, cell surface protein, ADI pathway, gluconeogenesis, pentose phosphate pathway and Hpr/CcpA system was found in presence of pediocin. Moreover, genes for key enzymes of glycolysis, PTS system, mprF and peptides transporter were found down-regulated. These results implicate that in the presence of pediocin *E. faecalis* persist the resistance acquisition by altering cellular physiology, metabolic and genomic processes using arginine as an alternative energy source in the absence of glucose.