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A proteomic approach to unveil Protein translation machinery holding a key for transition of planktonic cells to biofilm state in Enterococcus faecalis

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Abstarct

Enterococcus faecalis is a member of human gut microflora which causes nosocomial infection involving biofilm formation. We have generated Ethyl methyl sulfonate induced mutants defective in biofilm which were analysed using crystal violet assay, SEM and CLSM microscopy. AK-E12 was confirmed as biofilm efficient and AK-F6 as biofilm deficient mutants in this study. Growth curve pattern revealed AK-E12 was fast growing whereas, AK-F6 was found slow growing mutant. MALDI-TOF and 2D-Electrophorosis analysis revealed expression and suppression of many translation-elongation associated proteins in mutants compared to wild type. Protein translation elongation factor G, translation elongation factor Tu and ribosomal subunit interface proteins were down expressed and UTP--glucose-1-phosphate uridylyl transferase and Cell division protein divIVA were over-expressed in AK-E12 as compared to wild type whereas, in AK-F6, except 10 kDa chaperonin which was over-expressed other selected proteins were found to be down regulated. RT-PCR confirmed proteomic data except for the translation elongation factor G which showed contradictory data of proteome expression in AK-E12. Protein-protein interaction networks were constructed using STRING 10.0 which demonstrated strong connection of translation-elongation proteins with other proteins. Hence, we conclude that translation elongation factors are important in transition of planktonic cells to biofilm cells in E. faecalis.

Publications

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Biography

Dr. Asad U Khan graduated in Chemistry and did his post graduate in Biotechnology in 1994 and obtained a doctorate in Biochemistry from Aligarh Muslim University in association with International Centre for Genetic Engineering and Biotechnology, New Delhi.He joined as lecturer in 1997 and later proceeded for his post-doctoral research in RUTGERS University, New Jersey, USA during 2000-2003 for three years. Currently he is Professor and Coordinator in Biotechnology United Khan is recipient of many Fellowships and awards. He is recipient of BOYSCAST Fellowship of DST, Government of India to work as Visiting Scientist in one of the laboratories in University of Napoli, Italy during 2005. In year 2010 Dr. Khan has visited Hospital Biceter , Paris under DBT-CREST award programme of Department of Biotechnology. He has received grants from DST CSIR DBT ICMR and CCRUM.

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