Abstract Title: **How the fatty acid degradation pathway is effected by FadR regulator in *Escherichia coli***

Shikha Jindal, K.V.Venkatesh*

*Corresponding Author – venks@iitb.ac.in

Abstract

Fatty acids play an important role in various cellular processes i.e. transcriptional control, cell signalling and protein modification. In *Escherichia coli* K-12 BW25113, fatty acids metabolism is tightly regulated by FadR (fatty acid degradation regulator), to adapt cells to the genetic and environmental perturbation. FadR protein helps in transport, activation and metabolism of fatty acids. It acts as a negative regulator of fatty acid degradation and positive regulator of biosynthesis of fatty acids. Fermenter study has been done of wild-type and FadR mutant strain under aerobic conditions in Sartorius Biostat plus. 2g/l of sodium oleate was used in M9 media with Briz-58 as a non-ionic surfactant. External metabolites and oleate uptake rate were measured from GC-MS shimadzu. Estimation of metabolic fluxes from the genome-scale model for the quantification of fluxome. It divulges that TCA cycle gets more active in case of FadR mutant compared to the wild-type BW25113 strain. The possible explanation to this finding is that as in literature, it has been reported that FadR is a repressor of fatty acid degradation pathway so when it is mutated, the stress is been released from the fad pathway. A significant effect is also seen in regard to growth rate and uptake rate. It has also been observed that the flux through glyoxylate shunt also increased in the mutant strain due to the repression of iclR (isocitrate lyase Regulator), which represses the glyoxylate shunt genes.

Professional Biography

I am Shikha Jindal, pursuing my PhD under Prof K.V.venkatesh from IIT Bombay. Currently, I am in 3rd year of my PhD, working in metabolic Engineering and systems biology lab. My GATE rank was 36 (99.6 percentile) in Biotechnology. I completed my B.E in biotechnology from Panjab University, Chandigarh.



Email Id: shikhajindal92@gmail.com