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A novel approach for body weight management using a bacterial Surfactin lipopeptide**Khem Raj Meena, Ashwarya Parmar, Abhishek Sharma and Shamsheer S. Kanwar***

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*Corresponding author E-mail: kanwarss2000@yahoo.com**Abstract**

Aim: To explore the antiobesity activity of the Surfactin lipopeptide (LP) obtained from *B. subtilis* KLP2015 strain (Accession number KT459335).

Methods: Cytotoxicity of bacterial Surfactin towards a murine pre-adipocytic 3T3-L1 cell line was determined by MTT assay. The inhibition of porcine pancreatic lipase (PPL) and Steapsin by Surfactin lipopeptide was also detected by a colorimetric assay.

Results: The 50% inhibitory concentration (IC₅₀) value of Surfactin for 3T3-L1 cells was found to be ~15 µg/ml in the MTT assay. Surfactin lipopeptide of *B. subtilis* KLP2015 reduced the activity of Steapsin and PPL by 51.37% and 67.20%, respectively after 60 min of reaction time. The fat content in the murine 3T3-L1 cells gradually decreased by 31.09 and 36.85% after treatment with 30 µg/ml and 150 µg/ml of Surfactin, respectively as the 3T3-L1 cells treated with Surfactin shed considerable amount of oil droplets. In the Surfactin-PPL docking study, the Surfactin molecule interacted *via* hydrogen bonding with Ser53, His75 and Asp83 residues of PPL.

Conclusion: Surfactin LP of *B. subtilis* KLP2015 strain is an ideal molecule that may be developed as a candidate drug for the treatment of obesity in future.

Key words: *B. subtilis*; Lipopeptide; Murine pre-adipocyte cells; Obesity; Porcine pancreatic lipase; Surfactin.

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