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ASSESSING THE EFFECTS OF DIETARY L-METHIONINE SUPPLEMENTATION INDUCED EPIGENETIC ALTERATIONS IN TYPE 2 DIABETIC RATS

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Balanced nutrition plays an important role in the maintenance of healthy life. Imbalance in any of it, results in various metabolic disorders. L-Methionine (L-Met) is one of the essential amino acids which play an important role in variety of cellular processes. Reports suggest that dietary methionine restriction as well as its supplementation both have beneficial effects in animal models. But in long run methionine restriction has prominent adverse effects on bone, immune system and can cause cardiac adverse event (via hyperhomocysteinemia). Here, we report the protective effect of L-Met (0.45% L-Met supplementation in diet) on T2DM induced hyperglycemia, dyslipidemia and other complications. Interestingly, L-Met supplementation also activates hepatic p-AMPK and its downstream signaling molecule SIRT1, mimicking anti-diabetic drug metformin, an AMPK activator. Real Time PCR, results show that L-Met supplementation prevents diabetes induced increase in expression of master regulator FOXO1, hepatic DNMT1 expression and global histone H3K36 di-methylation. Furthermore, FOXO1 regulated genes, involved in hepatic glucose metabolism and lipogenesis are also modulated by L-Met supplementation. Chromatin-immunoprecipitation assay shows that L-Met supplementation decreases the H3k36me2 abundance on FOXO1 promoter. We provide first evidence for the involvement of epigenetic alterations in preventing progression of diabetes by L-Met supplementation.

Biography

Umashanker Navik has his completed M Pharmacy (Pharmacology and Toxicology) from NIPER SAS Nagar, B Pharmacy from University Institute of Pharmaceutical Sciences (UIPS), Panjab University, Chandigarh, India and is currently associated with Laboratory of Epigenetics and Diseases at NIPER SAS Nagar as a PhD Scholar. He is working on L-Methonine induced epigenetic changes in type 2 diabetes and non-alcoholic steatohepatitis under the supervision of Prof Kulbhushan Tikoo. He has been trained extensively in in-vitro, preclinical experimental techniques like handling laboratory animals, animal surgeries, physiological and biochemical measurements, histological, molecular biology (western blotting, RT-qPCR, Bisulphite sequencing, Chromatin Immunoprecipiation etc.), statistical analysis of experimental data and scientific data retrieval. Besides, he played a significant role in carrying out consultancy projects related to T2DM, NASH and Toxicity studies in GLP-certified National Toxicology Centre at NIPER SAS Nagar. Further, he is also mentoring junior researchers in different field CVDs, diabetes, NAFLD, and role of probiotics in metabolic diseases. His key interest research areas are evaluation of Pharmacological Interventions, Targeting Pathophysiological Cascades in metabolic diseases such as obesity, diabetes, non-alcoholic fatty liver disease and elucidation of its link with epigenetics. He has one paper published in Indian J Pharmacol.

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