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Fat fight against fat, a potential medication in treating obesity

Obesity is a risk factor for many diseases, including type 2 diabetes. Glucagon like Peptide-1 (GLP-1) and analogues are approved by FDA in treating type 2 diabetes and it has been reported for having weight lowering effects in type 2 diabetes patients. However, the underlying mechanism has not been studied so, we aimed to determine the contribution of Brown Adipose Tissue (BAT) thermogenesis to the weight lowering effect induced by Liraglutide, which is a full agonist of the GLP-1 receptor. Mice were fed with either chow diet or high fat high sucrose diet (HFHSD), and then Liraglutide or saline were injected daily for five weeks, which showed that Liraglutide significantly attenuated the weight gain along with attenuation of epididymal fat mass when compared to saline control group. Brown fat specific genes and uncoupled protein-1, were induced in the White Fat Tissue (WAT) after Liraglutide treatment with transcription factor shows PR domain-containing protein-16 (PRDM16) that binds and co-regulates C/EBP α and peroxisome proliferator-activated receptor gamma - α (PPAR- α) during brown fat differentiation. Peroxisome proliferator activated receptor -coactivator-1- α (PGC-1 α), which involved in regulating mitochondrial biogenesis and oxidative metabolism, was also up-regulated by Liraglutide. In addition to this, Liraglutide reduced HFHSD induced elevation of BAX-2, BCL-2 and Caspases-3 gene expression in fat tissue, which indicated that it reduced inflammation induced by obesity. Our results demonstrated the ability of Liraglutide to reduce BW and adiposity, which has a protective effect on diet induced obesity which can act through induction of browning of WAT which leads to elevated energy expenditure. Hence, Liraglutide is a potential therapy for obesity and obesity related metabolic disorders.

Biography

Lixin Li has completed her PhD from Norwegian University of Science and Technology and Post-doctoral studies from Department of Physiology, University of Toronto. She is an Assistant Professor at Central Michigan University, US. She has published more than 20 papers in journals related to diabetes and obesity. She was the invited speaker of several international conferences and has been serving as an Editorial Board Member of several journals.

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