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Effect of oleanolic acid on lipid metabolism of rats (Sprague Dawley) with fructose-induced obesity

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Obesity has become the recent times prevailing phenomenon which has serious implications on human health. This is a process where the body accumulates fats due to factors such as genetics, diet and physical inactivity. Lipid metabolism is the synthesis and degradation of lipids in cells. Lipid metabolism is the break down or storage of fats for energy and these fats are obtained from consuming food and absorbing them or they are synthesized by an animal's liver. Lipid synthesis and oxidation are two processes which plays an important in lipid metabolism. Mitochondria are organelles for cellular metabolism and function through regulation of energy production. Mitochondria are often called the powerhouses or energy factories of a cell because they are in charge of making adenosine triphosphate (ATP), the cell's main energy-carrying molecule. Therefore, lipid metabolism, signaling and apoptosis and its alterations may add to the development of metabolic disorders such as obesity, type-2 diabetes, insulin resistance and cardiovascular related diseases. The statistics shows that there is great intake of fructose worldwide due to fast foods; this consequently leads to obesity across the world. Oleanolic acid is a pentacyclic triterpenoid complex which possesses many promising pharmacological activities, such as hepatoprotective, anti-inflammatory, antioxidant and anticancer activities. However, there is limited information about direct influence of oleanolic acid on mechanism of anti-diabetic activity of oleanolic acid. The morphological changes (weekly weight recordings), GC-MS for lipid analysis, RT-qPCR differentiation marker genes and western blot analysis was done as well. In this study, the results showed that oleanolic acid down regulated the expression of genes responsible for fat deposition such as fatty acid synthase (FAS) while on the other hand, up regulated the expression of genes which are play significant role in alleviating lipid oxidation such as Carnitine Palmitoyl Transferase 1 (CPT-1), consequently reducing obesity.

Biography

Molefhi M Abotseng is currently pursuing PhD in Biochemistry at the Department of Biological Sciences, North West University, South Africa. He has completed his Master of Science degree in Biochemistry and Molecular Biology from Huazong Normal University, China. He has worked at the University of Botswana as Medical Scientist Lecturer at Faculty of Medicine in Botswana.

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