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Adiponectin regulation of AMPK on oleanolic acid treated Sprague Dawley rats

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AMPK is known to control glucose and lipid metabolism, two main candidates critical in the development of type-2 diabetes (T2D). Studies have shown that AMPK can be activated by adiponectin. Patients suffering from T2D are known to have low adiponectin concentration in their blood plasma. In this study we have assessed one anti-diabetic compounds; Oleanolic Acid (OA), if it could produce desirable effect in up-regulating adiponectin concentration and the subsequent regulation of AMPK. Sprague Dawley rats were fed with high fructose diet (HFD) to induce T2D and the rats that developed insulin resistance were considered as diseased, they were then treated with OA. Analysis of adiponectin concentration in blood plasma was done, AMPK gene expression and subsequent genes that play vital role in glucose and lipid metabolism (*GLUT-4* and *CPT-1*) in skeletal muscle tissue was also performed. The results showed 1.19 folds increase in blood plasma adiponectin concentration after OA administration. Furthermore AMPK gene expression showed 3.98 folds increase and *GLUT-4* gene expression was increased with 1.5 fold whereas *CTP-1* gene expression was increased with 1.59 folds. These results clearly indicate that OA produced good effects in ameliorating insulin resistance since it was able to up-regulate all the genes and adiponectin concentration which are well known to be abnormally suppressed in a situation of T2D. In conclusion, this study further confirms that OA can be used as an effective therapeutic agent to ameliorate T2D and this study also suggest that OA's mechanism of action could be through AMPK pathway.

Biography

Emmanuel Mukwevho is a Professor of Biochemistry at the School of Chemical and Physical Sciences at the NWU, South Africa. He has completed his PhD from University of Cape Town, South Africa. He has also obtained certificates in Project Management and in Financial Management from UCT. Presently, he has registered for MBA with NWU Graduate Business School.

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