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## Novel hybrid compounds from thiosemicarbazone and triazole as anti-diabetic agents and their antioxidant potentials

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**Objectives:** Diabetes Mellitus is a metabolic disease that threatens and reduces the quality of life. Eight hybrids (1a-h) of thiosemicarbazone and triazole were screened for their effects on genes related to Type 2 Diabetes as well as their antioxidant activity.

**Methods:** The influence of the hybrids on glucose transport genes (Glut-4, Mef2a and Nrf-1) was carried out using quantitative real time polymerase chain reaction (PCR). Also, antioxidant assays such as 1-diphenyl-2-picryl-hydrazyl (DPPH) radical scavenging ability, trolox equivalent antioxidant capacity (TEAC), ferric reducing antioxidant power (FRAP) and oxygen radical absorbance capacity (ORAC) were carried out using established techniques. From the results, all the hybrids showed antioxidant activities.

**Results:** Hybrids 1b, 1d, 1e and 1g exhibited high expression of Glut4 gene relative to insulin and control. All the hybrids except 1h and 1f expressed the Nrf-1 while only 1h did not express Mef2a relative to control. Among all the compounds, 1b showed the highest DPPH radical scavenging ability and TEAC values. FRAP and ORAC of 1c and 1d respectively had the highest values. In all the antioxidant assays carried out, 1a was shown to have the lowest antioxidant activities.

**Conclusions:** Hybrids 1d and 1g showed consistent pattern of glucose transport pathway gene transcription with all the hybrids showing antioxidant potentials though, at varying extents. These hybrids could be potential candidates eliciting anti-diabetic and antioxidant effects.

### Biography

Emmanuel Mukwevho is a trained Biochemist, Molecular Biologist and Cell Biologist trained from University of Cape Town, South Africa. He is currently employed at the University of North West, South Africa where he teaches Biochemistry. His research is mainly on Diabetes and Obesity, where he focuses on Lipid metabolism and Glucose transport. As such mitochondrial oxidative genes are studied together with glucose transport related genes. The research focus is to find novel therapeutics that can better manage or treat these health conditions. Since antioxidants play crucial role in the development and pathogenesis of these diseases, we also focus on antioxidants properties both in plants and chemical compounds.

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