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Characterizing chalo-naringenin analogs as putative therapeutic agents for type 2 diabetes

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Type 2 diabetes (T2D) is characterized by impaired insulin secretion and peripheral insulin resistance. Despite many classes of drugs available, T2D is still projected to increase by 55% in 2035. Citrus fruit-derived flavonoid, naringenin has been reported to have antidyslipidemic, anti-oxidant and more recently metformin-like antidiabetic effects. Metformin, the most commonly used drug for T2D management acts by activating adenosine monophosphate activated protein kinase (AMPK). Naringenin's anti-diabetic effects could be mediated by AMPK activation. Although naringenin has been shown to have anti-diabetic properties, it is less lipophilic and has poor water solubility hence chalo-naringenin analogs with enhanced pharmacological activities were synthesized. A series of 11 compounds of 4-[(cyclopropylcarbonyl) amino] chalo-naringenin analogues were synthesized using Claisen-Schmidt and characterized by IR, ¹H-NMR and ¹³C-NMR. An intermediate compound, N-(3-acetylphenyl) cyclopropanecarboxamide synthesized was reacted with commercially available aldehydes to yield the final amino-chalo-naringenin series. The synthesized compounds showed characteristic peaks on IR, ¹H-NMR and ¹³C-NMR and fit very well in the hydrophobic binding pockets of AMPK. They also presented good binding affinity to the enzyme as shown by computer simulation suggesting potential metformin-like antidiabetic effects. Further, *in vitro* and *in vivo* antidiabetic studies are suggested to elucidate the molecular mechanisms of these compounds.

Biography

Nyane N A has completed her BPharm Degree from University of Lesotho. She has enrolled in her studies at University of KwaZulu-Natal where she is currently doing her research under the department of Pharmacology, School of Health Sciences. She was awarded first prize (30000-travel voucher) in research symposium 2016 for winning in the Masters oral category held by College of Health sciences. She has assisted the Honors students with their Laboratory Experiments. She is lecturing on third level and fourth level at University of KwaZulu-Natal in school of Pharmacy. She has two accepted manuscript in *Journal of Pharmacology* and the other is *PLOS ONE*.

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