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Synthesis and Characterization of 5-pentadecyl-2,4-thiazolidinedione and 4,4'-[ethane-1,2-diylbis(oxy)]dibenzonitrile

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Abstract: The promising activity of thiazolidinediones has made it an attractive molecular feature in the development of new derivatives aimed to exhibit pharmacological significance. Thiazolidinedione-derived medicines are highly potent drugs for the treatment of diabetes mellitus type II (T2DM); it is known for its remarkable anti-hyperglycemic and insulin sensitizing property. Research shows that modification of the substituents on the thiazolidine-2,4-dione (TZD) moiety may lead to a plethora of beneficial biological activities. In this study, a derivative of TZD, 5-pentadecylthiazolidine-2,4-dione, containing a 15-carbon alkyl chain was prepared. The preparation involves the bimolecular nucleophilic substitution (S_N2) reaction of thiazolidine-2,4-dione and pentadecyl bromide with piperidine base and tetrahydrofuran as solvent. The product was obtained as white powder with a melting point of 54-55°C in 9.8 % yield. The compound will hopefully show greater potency and less adverse side effects relative to the anti-T2DM drugs present in the market. The compound was characterized using thin layer chromatography, melting point determination, and mass spectrometry.

Key Words: Thiazolidinedione, diabetes, anti-hyperglycemic; nucleophilic substitution