Diaryl Sulfonamides: Synthesis, Characterization and In Vitro Biological Evaluation as CETP Inhibitors

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Abstract

Hyperlipidemia is characterized by an increase in low-density lipoprotein (LDL), triglycerides and total cholesterol, and decrease in high-density lipoprotein (HDL). In addition, hyperlipidemia is a major risk factor for cardiovascular diseases, such as atherosclerosis and myocardial infarction. Cholesteryl ester transfer protein (CETP) facilitates the transfer of cholesterol ester from HDL to LDL and very low-density lipoprotein. CETP inhibition is a promising approach to prevent and treat cardiovascular diseases. By inhibiting lipid transport activity, it increases HDL levels and decreases LDL levels.

In this study, fourteen diaryl sulfonamides **6a-6g** and **7a-7g** were prepared, and the structure of these compounds was fully determined using ^{1}H-NMR, ^{13}C-NMR, HR-MS, and IR. These compounds underwent biological evaluation *in vitro* and showed different inhibitory activities against CETP; compounds **7a-7g** showed the highest inhibitory activity with 100% inhibition while compounds **6a-6g** ranged from 0%-42.6% at 10μM concentration. It was found that compounds **7a-7g** with four aromatic rings had the best inhibitory activity.

Keywords: atherosclerosis, cholesterol, cholesteryl ester transfer protein, diaryl sulfonamides, triglycerides.