Piperazine Sulfonamides: Synthesis, Characterization, and *In Vitro* Biological Evaluation as Potential DPP-IV Inhibitors

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Abstract

Diabetes is a chronic illness that needs persistent medical awareness and continuous patient self-management instruction to prohibit the acute complications. It is identified by hyperglycemia that happen either when the pancreas does not produce sufficient insulin or when the body cannot efficiently use the insulin it fabricates. DPP-IV inhibitors minimize glucagon and blood glucose levels by increasing the incretin levels (GLP-1 and GIP), leading to elevation of insulin secretion from pancreatic beta cells.

In the present study, seven piperazine sulfonamides derivatives **3a**-**3g** were synthesized and completely identified using ^{1}H-NMR, ^{13}C-NMR and IR. These compounds were exposed to *in vitro* biological evaluation tests and showed close inhibitory activities ranging from 17% - 22% at 100µM concentrations.

Piperazine sulfonamide derivatives were established to be successful scaffold as possible DPP-IV inhibitors, where presence of EWG such as Cl (as in **3a**, **3b**, **3c**) improves the activity of the compounds more than EDG such as CH_3 (as in **3d**, **3e**) at the same positions.