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# Design, synthesis, and characterization of some *N*-(piperidine-4-yl)benzamide derivatives for the treatment of diabetes

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**ABSTRACT** *N*-(Piperidine-4-yl)benzamide **(S3I2)** is a key pharmacophore for GPR119 agonists, enhancing insulin secretion and incretin release without hypoglycemia. Its design optimizes receptor binding, bioavailability, and glucose homeostasis, making it a promising antidiabetic agent. A series of *N*-(piperidine-4-yl)benzamide derivatives **(S3F1-S3F6)** was synthesized via a two-step process. Benzoyl chloride **(1)** reacted with tert-butyl 4-aminopiperidine-1-carboxylate **(2)** to form intermediate-1 **(S3I1)**, followed by deprotection with trifluoroacetic acid to yield intermediate-2 **(S3I2)**. The final compounds were obtained by amidation coupling of **S3I2** with various substituted benzoic and nicotinic acids/chlorides using 1-ethyl-3-(3-dimethylaminopropyl) carbodiimide, 1-hydroxybenzotriazole/HATU, triethylamine, and dimethylformamide. *In silico* studies, including pharmacophore modeling and docking simulations (AutoDock 4.0), assessed binding interactions of designed ligands with the GPR119 receptor. Homology modeling (MODELLER software) was used to design the receptor. Docking results identified **S3F1** and **S3F3** as the most promising ligands, exhibiting strong binding affinity, highlighting their potential for further development as antidiabetic agents.

**KEYWORDS** 4-Aminopiperidines, Amidation, Diabetes, GPR119 agonists, *N*-(Piperidine-4-yl)benzamide.

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