International Journal of PharmTech Research
CODEN (USA): IJPRIF, ISSN: 0974-4304, ISSN(Online): 2455-9563
Vol.14, No.01, pp 156-165, 2021

Design, Synthesis and Evaluation of Piperidinyl Coumarin Derivatives as Potential Antidiabetic Agents

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Abstract : Coumarin derivatives have been reported to exhibit a promising therapeutic effect on diabetes. In present study preliminary *insilico* screening of various novel analogues of piperidinyl coumarin derivative were carried out. The analogues with highest doking score and hydrogen bond interaction were taken for wet lab synthesis. Synthesis was carried out by following steps, N- chloro acetylation of piperidine, amide formation, conversion of amide to nitrile group, coupling of piperidine derivative with various amino coumarin derivatives. The structure of the desired derivatives were confirmed at each level by spectroscopic studies like, FT-IR, ^{13}C-NMR, ^{1}H-NMR and Mass Spectra. After confirmation of structure, *in vitro* studies of synthesized derivatives were carried out by α-glucosidase inhibition assay and α-amylase inhibition assay method by using acarbose as standard. Among the proposed derivatives 1-(-(2-oxo-2H-chromen-6-yl)amino)acetyl)piperidine-2-carbonitrile (4C1) displayed significant α-glucosidase and α-amylase inhibition activity . The newly synthesized compounds may provide valuable template for future design and optimization to produce α-glucosidase analogues.

Key words : Coumarin, piperidine, α-glucosidase, α-amylase, Autodock vina.

Shiny George *et al* /International Journal of PharmTech Research, 2021,14(1): 156-165.

DOI= http://dx.doi.org/10.20902/IJPTR.2021.140113

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