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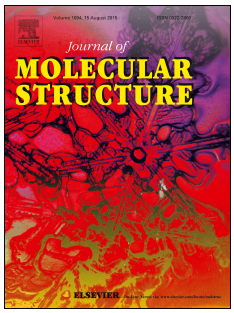

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Drug repurposing of Novel Quinoline Acetohydrazide derivatives as potent COX-2 inhibitors and anti-cancer agents

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Abstract

Novel QuinolineAcetohydrazide (QAh) derivatives (9a-n) were firstly evaluated *in silico* to determine their anti-inflammatory and anti-cancer efficacy via the mechanisms of COX1 and COX2 inhibition, and NF-κB, HDAC and Human Topoisomerase I pathways respectively. In the studied set, the trifluoro substituted QAh derivatives: (E)-N'-(4-(trifluoro methyl) benzylidene)-2-(7-fluoro-2-methoxy quinolin-8-yl) acetohydrazid and (E)-N'-(3-(trifluoro methyl) benzylidene)-2-(7-fluoro-2-methoxy quinolin-8-yl) acetohydrazide are determined to be potential leads, indicated from their best docked scores, relative ligand efficiency, and significant structural attributes evaluated by *ab initio* simulations. The only setback being their partition co-efficient that retrieved a red flag in the evaluation of their Lipinski parameters. The experimental i*n vitro* studies confirmed the significant enhancement as COX-2 inhibitors and appreciable enhancement in MTT assay of breast and skin cancer cell lines. Significantly, trifluoro substituent in the quinoline scaffold can be reasoned to note the excellent binding affinity to all the evaluated drug targets.

Keywords: *QuinolineAcetohydrazide; COX 2 inhibitors, Anti-inflammatory agents; Anti-cancer agents; Drug Design; Molecular Docking study; Lipinski parameter.*