Synthesis, docking study and neuroprotective effects of some novel pyrano[3,2-c]chromene derivatives bearing morpholine/phenylpiperazine moiety

Abstract

Novel pyrano[3,2-c]chromene derivatives bearing morpholine/phenylpiperazine moiety were synthesized and evaluated against acetylcholinesterase (AChE) and butyrylcholinesterase (BuChE). Among the synthesized compounds, N-{3-cyano-4-(4-methoxyphenyl)-5-oxo-4,5-dihydropyrano[3,2-c]chromen-2-yl}-2-(4-phenylpiperazin-1-yl)acetamide (6c) exhibited the highest acetylcholinesterase inhibitory (AChEI) activity (IC50 = 1.12 µM) and most of them showed moderate butyrylcholinesterase inhibitory activity (BChEI). Kinetic study of compound 6c confirmed mixed type of inhibition towards AChE which was in concord with the results obtained from docking study. Also, it was evaluated against β-secretase which demonstrated low activity (inhibition percentage: 18%). It should be noted that compounds 6c, 7b, 6g, and 7d showed significant neuroprotective effects against H2O2-induced PC12 oxidative stress. © 2017 Elsevier Ltd.