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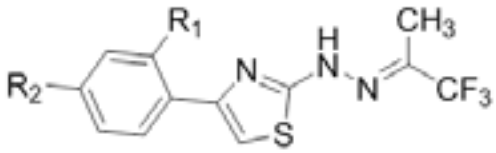
Synthesis of new thıazole derivatives as anticholinesterase and monoamine oxidase inhibitors

Begum Nurpelin Saglik
Anadolu University, Turkey

Alzheimer's disease (AD) is a progressive neurodegenerative disease that leads to the most generic form of dementia in older people. The anticholinesterase drug design strategy is based on the cholinergic hypothesis, suggesting that inadequate cholinergic neurotransmission in AD is responsible for the progressive loss of cognitive and memory capacities. Besides, recent studies have shown that monoamine oxidase enzymes (MAOs) are associated with psychiatric and neurological disorders such as depression, Parkinson's disease (PD) and AD. MAO-B activity increases in association with gliosis, which can result in higher levels of H_2O_2 and oxidative free radicals. For this reason, MAO-B inhibitors are potential candidates as anti-AD drugs due to the regulation of neurotransmitters and the ability to prevent oxidative damage in the central nervous system (1). In this study, we described the synthesis of some new thiazole derivatives as potential anticholinesterase and MAO inhibitory compounds. The structures of the synthesized compounds were confirmed using FT-IR, ^{1}H-NMR, ^{13}C-NMR, and HRMS spectral data. The anticholinesterase activity assay of the synthesized compounds was performed using Ellman's colorimetric method (2). Inhibitory activity of the compounds against *h*MAO-A and *h*MAO-B enzymes was evaluated by using in vitro Amplex Red® reagent based fluorometric method (3). According to the enzyme inhibition assays, synthesized compounds displayed promising inhibitory potential against ChE and MAO enzymes to different extends. Compound 7 was found as the most active derivative in the series. Docking studies of compound 7 revealed that this compound has a considerable binding capacity to enzyme active sites.



General formula of synthesized compounds

Biography

Begüm Nurpelin Saglik is a research assistant in Anadolu University Faculty of Pharmacy, Department of Pharmaceutical Chemistry. She has completed her master's degree in 2016. She is doing her PhD now and is in the fifth semester of PhD. She has published more than 25 papers in reputed journals and has delivered more than 50 poster presentations to date. Synthesis of new enzyme inhibitor candidates, enzyme inhibition activities and evaluation of molecular docking studies constitutes her main research area.

bnsaglik@anadolu.edu.tr

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