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Synthesis and evaluation of new thiadiazole derivatives as monoamine oxidase inhibitors

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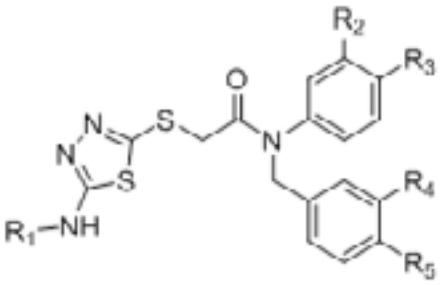
MAO exists in two isoforms as MAO-A and MAO-B. MAO A catalyzes the oxidative deamination of serotonin (5-hydroxytryptamine, 5-HT), and the therapeutic use of inhibitors of MAO A is primarily in the treatment of depression. MAO B is responsible for the degradation of benzylamine and α-phenethylamine, and MAO B inhibitors are used to treat neurodegenerative disorders such as Parkinson's disease (1). Endogenous amine metabolism results in the formation of toxic reactive oxygen species responsible for oxidative damage and neurodegeneration. Therefore, MAO inhibitors are used for the treatment of neurodegenerative and neurological disorders (2). Some studies indicated that benzylamine moiety and thiadiazole possess MAO inhibitory activity (3,4).

In this study, we have reported the synthesis and MAO inhibitory activities of new thiadiazole derivatives. Chemical structures of the synthesized compounds were identified by spectroscopic methods. The synthesized compounds were screened for their hMAO-A and hMAO-B inhibitory activity by an in vitro flurometric method. The cytotoxic activities of the final compounds were screened against healthy NIH3T3 cell line (mouse embryonic fibroblast cells). The compound 3b displayed a significant inhibitory activity against MAO-A; whereas the compound 3e presented remarkable inhibition on MAO-B.



Biography

Ulviye Acar Çevik graduated at the age of 25 years from Anadolu University in 2013. She has been continuing her PhD at the same university since 2015. She has published more than 15 papers in reputed journals and has been studying on her thesis.

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