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THESIS ABSTRACT

Some efficient synthetic approaches to construct heterocyclic systems

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Background: Heterocyclic compounds containing nitrogen, oxygen and sulfur atoms possess various interesting biological activities. Among these compounds, 1,3-oxathiolan-5-one and its diverse derivatives which are literature documented ones of the most potent core structures in drug design and pharmaceutical industry. **Aim**: This thesis describes the utility of 1,3-oxathiolan-5-one in the synthesis of pyridinonethiol and their annulated systems through multicomponent reaction of 2-methyl-2-phenyl-1,3-oxathiolan-5-one (1), aniline and α,β-unsaturated carbonyl compounds. **Materials and Methods:** Different bioactive heterocyclic systems such as thiophene, furo-oxathiolone, mercapto-diphenylcyclopenta-2,4-dien-one, triazole and thiadiazine were efficiently synthesized via tandem reactions of 1,3-oxathiolan-5-one 1 with different nucleophilic reagents. **Results**: The structures of newly synthesized compounds were confirmed by spectral data, elemental analyses and mechanically discussed. Also, in vitro antioxidant and antitumor activities of these compounds were evaluated. In addition, the synthesized compounds were screened against hepatic cancer cell line HepG-2, as the optimistic results exhibited that compounds 29, 33 and 34 have excellent antioxidant and anti HepG-2 activities. **Conclusion**: The synthesized heterocyclic compounds possess significant anti-bacterial and anti-cancer capabilities.

Keywords: Antitumor; Antioxidant; Heterocyclization; Oxathiolanone; Pyridinonethiol

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