Regioselective Reactions, Spectroscopic Characterization, and Cytotoxic Evaluation of Spiro-pyrrolidine Thiophene

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Abstract

Spiro-oxo-indole/pyrrolidine-thiophene base possessed significant pharmacological activity. The [3 + 2]
cycloaddition reactions of thia-methine ylide respected through multi-component reaction affording regioselective
and stereoselective spiroindoline-3,20-tetrahydrothiophene derivative 3. Reaction of such compound
with different electrophilic and nucleophilic reagents afforded bioactive heterocyclic compounds 4–16. Biological
evaluation showed that these synthesized spiro-pyrrolidine exhibited moderate to good cytotoxic activity.
Among them, compounds 7 and 14 displayed the best cytotoxic activity against MCF-7 and Wl-38
cells with the IC50 values of 7.02 ± 0.6 and 8.97 ± 0.9 μm (very strong), respectively. Compounds 4, 5,
and 12 exhibited strong cytotoxicity's with IC50 16.28 ± 1.7, 11.16 ± 1.1, and 19.14 ± 1.7 μm, respectively,
against MCF-7 mammary gland cell line. All compound structures were supported by spectroscopic data and
elemental analysis.

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