

Synthesis and Biological Evaluation of novel Quinoxaline containing N-substituted thiazolidine-2,4-dione derivatives as Anti-cancer Agents

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Abstract

Introduction: Quinoxalines belong to the N-containing heterocyclic compounds that stand out as having promising biological activity due to their privileged scaffold. Quinoxaline derivatives constitute the basis of many insecticides, fungicides, herbicides, as well as being important in human health and as receptor antagonists. On the other, the compounds containing thiazolidine-2,4-dione have demonstrated wide range of pharmacological activities, which include antimicrobial, antiviral, antidiabetic and anticancer activity. In this research, we have synthesised a new quinoxaline derivatives containing N-substituted thiazolidine-2,4-dione derivatives and evaluated for antitumor activity against a 3-cell line panel, consisting of MCF7 (breast), NCI-H460 (lung), and SF-268 (CNS).

Methods and Results: In a 250 ml three necked flask equipped with teflon coated mechanical stir bar, chloroacetic acid and thiourea have been dissolved in distilled water and the contents of the flask were heated in the presence of hydrochloric acid. The precipitate was filtered and washed with water and dried before recrystallization. Consequently, the new synthesized thiazolidinedione derivatives were condensed *in situ* by quinoxaline aldehydes and substituted benzyl halides in N,N-Dimethylformamide. The resulted products were washed with water and then recrystallized in appropriate solvent. Structures of all the synthesized compounds were confirmed by IR, ¹H NMR, ¹³CNMR, and Mass spectral data. The MTT assay of synthesized hybrids showed promising and effective anti-cancer activity against 3-cell cell lines. The current results indicate that these quinoxaline derivatives are novel and promising agents for further development towards a treatment for cancer.

conclusion: In the present study, series of new N-thiazolidine-2,4-dione incorporated quinoxaline ring were synthesized. All compounds were screened against two different cancer cell lines using MTT assay method.

Keywords: Thiazolidine-2, 4- Dione, Anticancer activity, MTT assay method