Synthesis of hybridized benzylthio-1,3,4-thiadiazol-isatin derivatives and *in vitro* cytotoxicity evaluation

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Abstract

Introduction: In this research synthesis of hybridized benzylthio-thiadiazol-isatin derivatives has been reported and then the effects of the synthesized compounds were investigated on cancer cell lines and molecular docking was also studied on proposed receptor.

Methods and Results: This project was done in 2 steps that includes the synthesis of new hybrids of thiadiazole-isatin derivatives and characterized by various spectroscopy methods such as "Mass spectroscopy, Infrared spectroscopy, and ^{1}H NMR". To study cytotoxic effects of the compounds, different concentrations of synthesized derivatives were prepared and tested on the three rank 7 cellular MCF-7 "breast cancer", PC3 "Prostate carcinoma", and SKNMC "Norobelastoma". The method used was MTT that after various stages of the solution and added MTT, the color was measured by the producted formazan during measurements suitable wave. The color ratio was as equal as the number of living cells. For comparing the cytotoxicity we used doxorubicin as control drug.

Conclusions: The most potent of the compounds were **3b**, **4c, and 4d** against MCF7 cell line, **3b, 4h** against PC3 cell line, and **3b,4f,** and **4h** against SKNMC cell line which seems to be the best ones relative to the control drug. Also we found that treatment with **3b** led to decrease in IC_{50} and significantly increased cytotoxicity effects of the compound in PC3, SKNMC and MCF7 cells lines.

Key words: Synthesis; 1,3,4-thidiazole, Isatin, cytotoxicity