Salahaddin University-Erbil
Science College
Chemistry Department

A mini-Review on the Synthesis and biological evaluation of Isatin Derivatives

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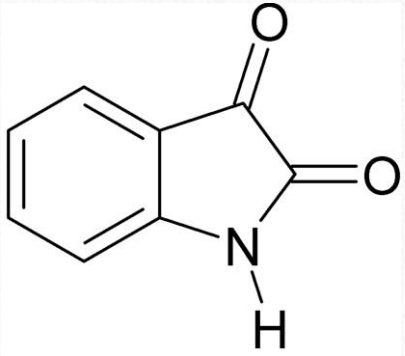
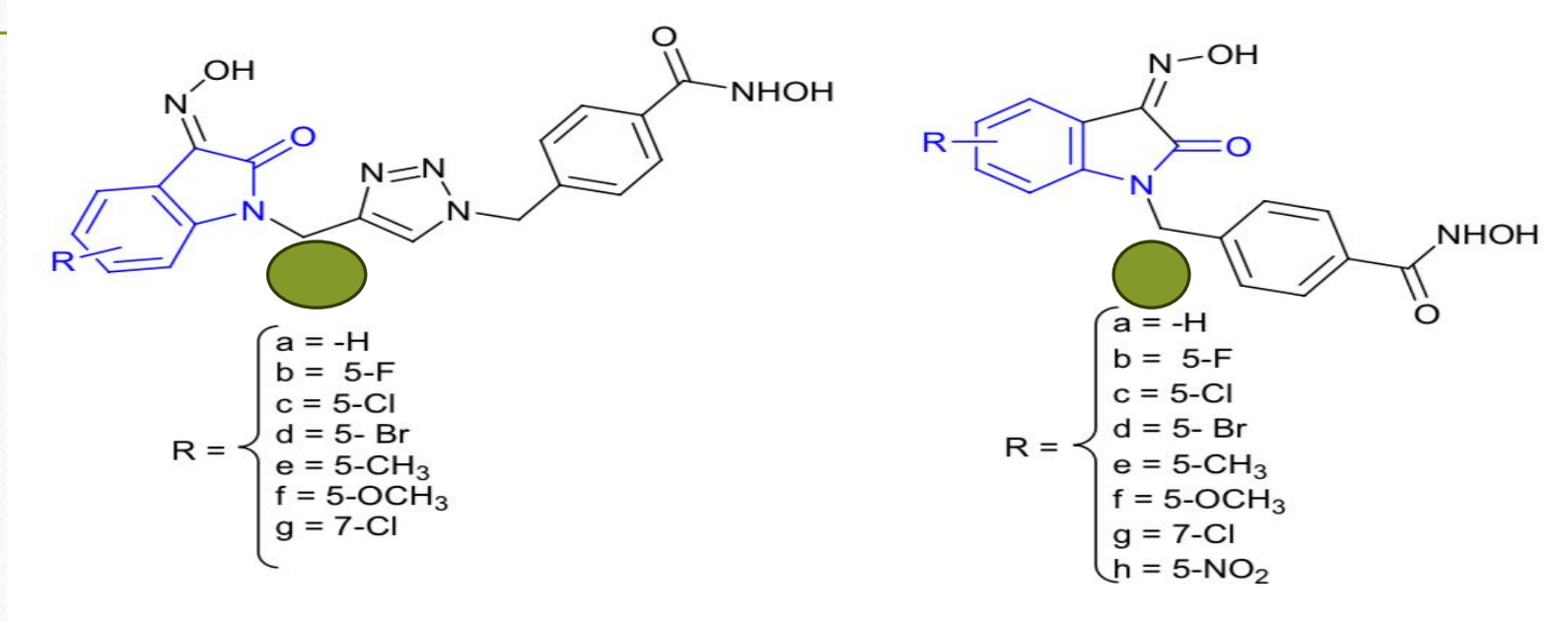
Introduction

Isatin is a heterocyclic nitrogen compound that has attracted much interest in recent years due to its diverse biological and pharmacological activities. It can be used in many medical and biological applications, such as antidiabetic, antibiotic, and anticancer agents. Put **Ref. Number**



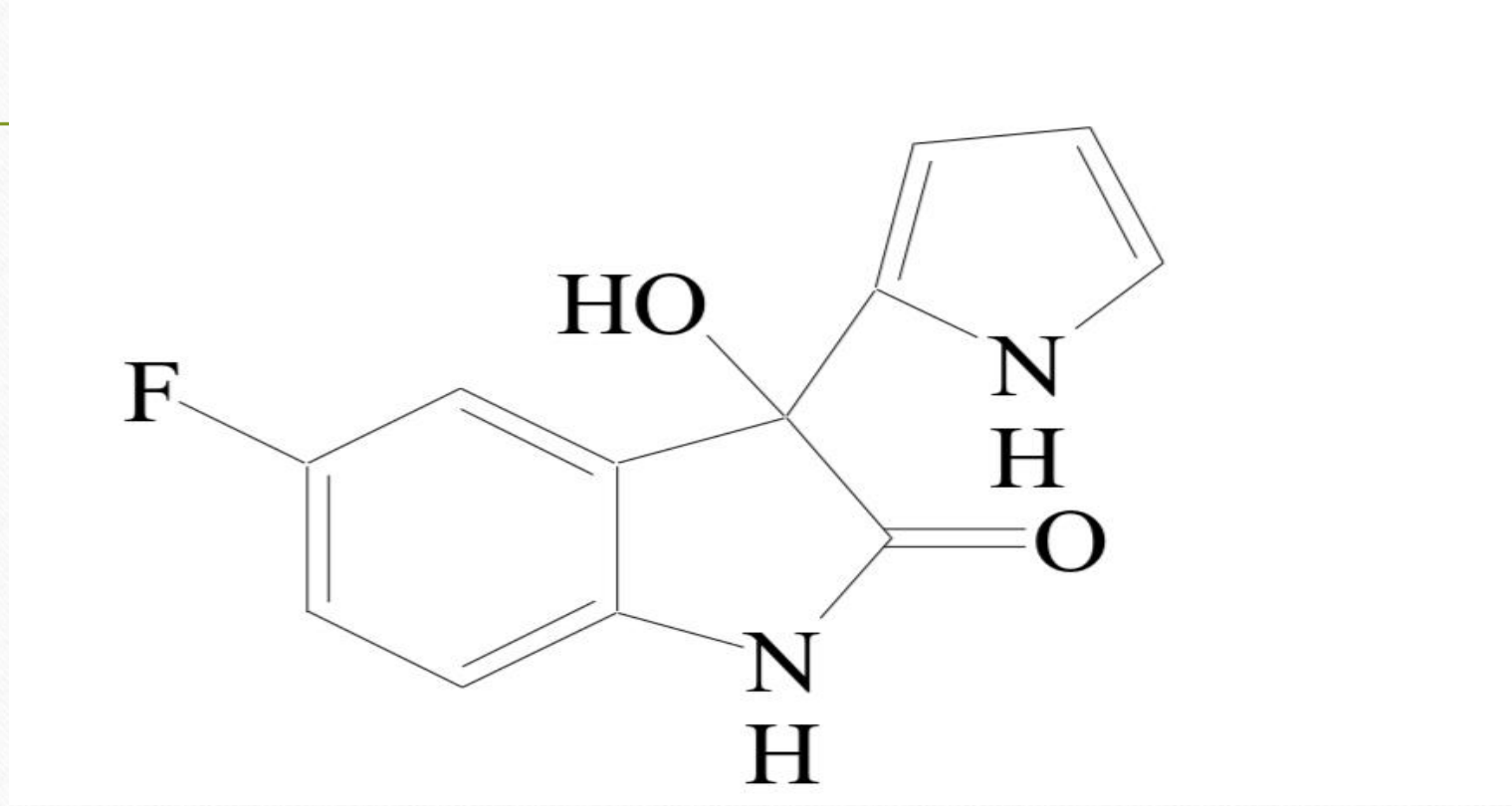
BIOLOGICAL APPLICATIONS OF ISATIN DERIVATIVES

The anti-cancer activity of Isatin derivatives shown below

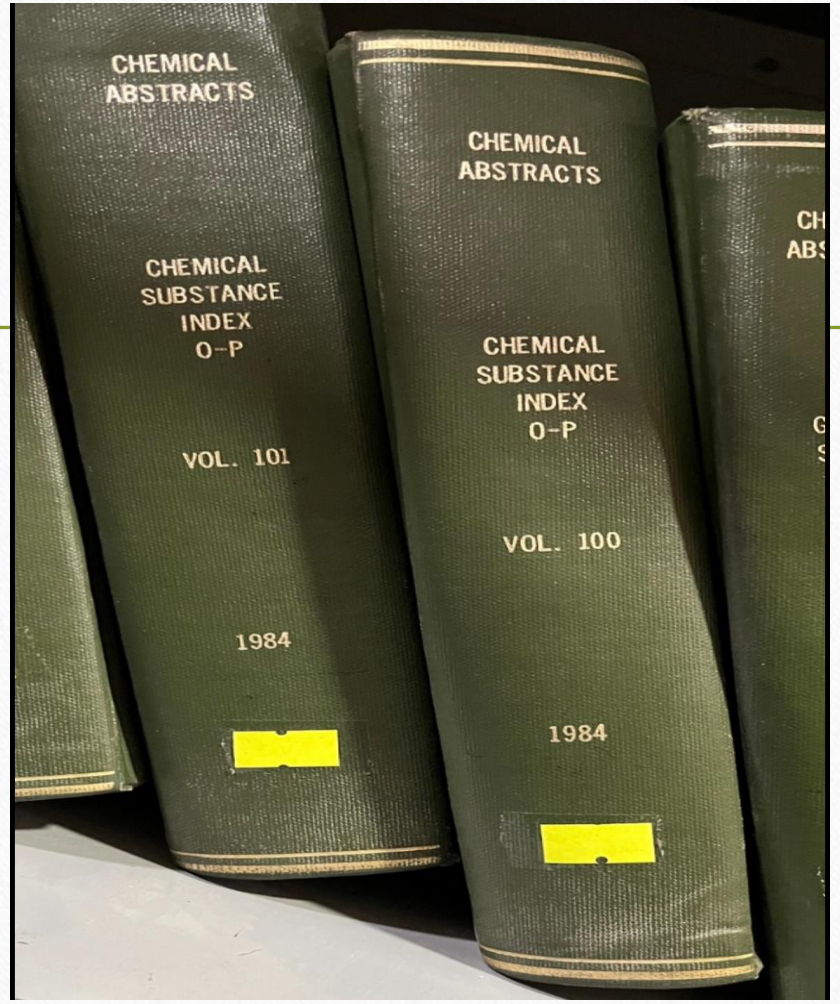


Put the general name of the compound

Isatin derivatives as anti-cancer activity



Put the general name of the compound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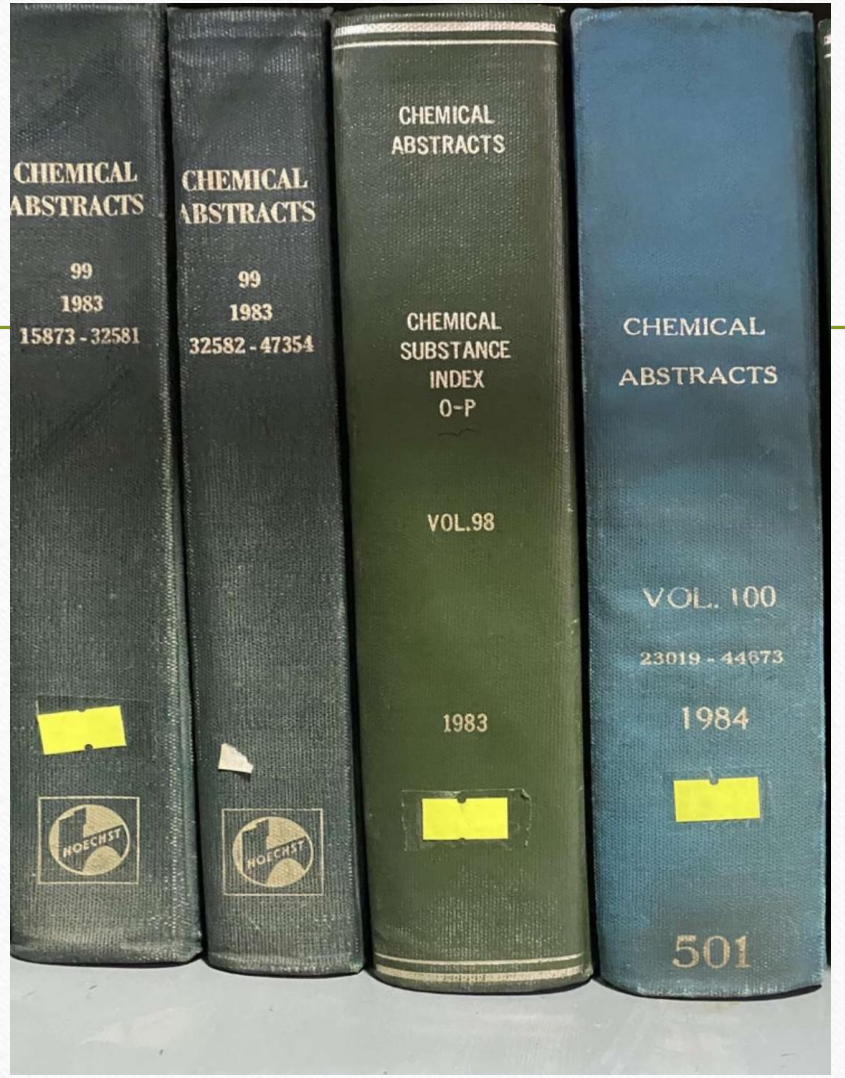
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Article name

Hybrid pharmacophore design and synthesis of isatin–benzothiazole analogs for their anti-breast cancer activity

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ABSTRACT

A hybrid pharmacophore approach was used to design and synthesize isatin–benzothiazole analogs to examine their anti-breast cancer activity. The cytotoxicity of these compounds were determined using three different human breast tumor cell lines, MDA-MB231, MDA-MB468, MCF7, and two non-cancer breast epithelial cell lines, 184B5 and MCF10A. Although all compounds examined were quite effective on all the cancer cell lines examined, the compounds 4-bromo-1-diethylaminomethyl-1*H*-indole-2,3-dione (**2l**) and 4-chloro-1-dimethylaminomethyl-3-(6-methyl-benzothiazol-2-ylimino)-1,3-dihydro-indol-2-one (**5e**) emerged as the most active compounds of this series. Importantly, the cytotoxic effect of **2l** was 10–15-fold higher on cancer than non-cancer cells, suggesting that this compound can be very effective for the control of breast cancer with low side effects. Since **2l** showed effective cytotoxicity on MCF7 cells and arrested the cells at G2/M at a similar concentration, these two phenomena may be closely correlated. We conclude that the isatin-linked benzothiazole analog can serve as a prototype molecule for further development of a new class of anti-breast cancer agents.

References (Journal)

- Prayitno, B. and Santoso, M. 2020. Biochemical activities of new isatin derivative against WiDr colon cancer *Journal of Physics: Conference Series*. Available at: https://iopscience.iop.org/article/10.1088/1742-6596/1422/1/012017 (Accessed: 16 January 2024).

Reference (Book)

- Joule, J.A. and Mills, K. (2010) *Heterocyclic Chemistry*, 5th Edition, Wiley
- A John Wiley & Sons, Ltd., Publication

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