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RESEARCH ARTICLE

Cytotoxicity Evaluation of Chalcone-Coumarin Conjugates Against A549 Cell Line

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ABSTRACT:
Coumarins and chalcones have been molecules of considerable interest amongst medicinal chemists owing to their vivid pharmacological potentials including anticancer. A few coumarin-chalcone conjugates (C1-C5) with good antioxidant potential were evaluated for in vitro cytotoxicity against A549 cell lines using MTT assay. The IC_{50} of the conjugates was calculated after 24 h of treatment. The compounds C3 and C4 with higher mesomeric effects exhibited by the substituents were found to be possessing significant cytotoxic potential with IC_{50} values of 22.90 ± 2.1, 26.73 ± 6.6 µM respectively.

KEYWORDS: Chalcone, coumarin, MTT assay, Cytotoxicity, A549, Anticancer, etc.

INTRODUCTION:

Cancer is any malignant growth caused by abnormal and uncontrolled cell division.[1] It is the prime cause of death over the world with an estimated number of 11.4 million deaths by the year 2030.[2] Irrespective of the several therapeutic options, the treatment of cancer presents several hindrances and the persistent investigations to develop new, less toxic, and highly potent anticancer molecules is being conducted worldwide.[3-6]It has been reported that most of the anticancer molecules are non-selective due to direct interaction with various cellular components. The α,β-unsaturated Michael acceptors have been molecules of wide interest as they can be modified to attain specific interaction with target nucleophiles in the cell.[7] Chalcones, are α,β-unsaturated systems, found widely in plants and have shown a wide array of biological actions such as antiiflammatory[8], antibacterial[9], antimalarial[10], antifungal[10], antioxidant[11,] and anticancer[11]. Chalcones are also reported to be potential inducers of cellular apoptosis.[12] Coumarin, is also a class of compounds extensively found in plants, bacteria, and fungi. They are also known to possess several pharmacological and biological actions like antibacterial[13], anti-inflammatory[14], antioxidant[15], antimutagenic[16,] and anticancer[17].

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To assess for preliminary anticancer activity in terms of cell viability, the 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) and 3-(4,5-dimethylthiazol-2-yl)-5-(3- carboxymethoxyphenyl)-2-(4-sulfophenyl)-2H-tetrazolium inner salt (MTS) *in vitro* cytotoxicity assays are considered two of the most economic, reliable and convenient methods.[18]

In our previous investigation, we have reported the synthesis and antioxidant potential of a few novel chalcone-coumarin conjugates. Owing to the antioxidant potential in the conjugates; in the present investigation, we have reported the preliminary cytotoxic action of the chalcone-coumarin conjugates against human lung cancer cell line.

MATERIAL AND METHODS:

Chemicals:

Dulbecco's Modified Eagle's Medium (DMEM), antibiotics, Amphotericin B, and Fetal Bovine Serum (FBS) were purchased from Sigma Aldrich. All other chemicals used were of analytical grade and used as obtained.

Cell lines and Culture:

The human lung cancer cell line (A549) was purchased from National Centre for Cell Science (NCCS, Pune, India). The cell line was maintained in the laboratory and the cells were grown using DMEM. The culture media was supplemented with 10% FBS and antibiotics