

Poster 57

Assessment of the Antitumor Potential of Flavonoid-Amino Acid Conjugates

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Abstract

Background: Cancer is a complex disease characterized by multiple alterations that promote uncontrolled cell proliferation and resistance to cell death. Multidrug resistance to conventional chemotherapy often results in treatment failure, highlighting the need for alternative therapeutic strategies [1]. In this context, natural products and their derivatives have attracted significant interest for their potential anticancer properties. Of particular interest, chiral derivatives of flavonoids (CDFs) have demonstrated the ability to inhibit the growth of specific human tumour cell lines, emphasizing the critical role of stereochemistry in their biological activity [2, 3]. **Objective:** This study aimed to screen a small library of previously synthesized CDFs in a panel of cancer cell lines to identify the most promising compounds for further study as potential chemotherapy drugs. Additionally, this study also aimed to assess their effects on key aspects of cancer biology, including metabolic processes and the mechanisms of cell death. **Methods:** Cell viability assays were conducted on three tumour cell lines: A375-C5 (melanoma), MCF-7 (breast), and NCI-H460 (lung), using synthesized CDFs. The most effective compound was further analysed based on several parameters of cancer cells, including extracellular levels of glucose and lactate. Furthermore, Annexin V/PI double staining in conjunction with flow cytometry was conducted to evaluate the induction of apoptotic cell death. **Results:** The cytotoxic effects of nine CDFs were assessed, leading to the selection of one compound for further investigation due to its GI₅₀ values being below 20 µM in all cell lines. In terms of metabolism, the quantification of glucose and lactate revealed unexpected results, as both glucose consumption and lactate production increased. The CDF 6HF-DTrp induced significant changes in lactate production across all three cell lines. However, its effect on glucose consumption was only significant in the A375-C5 cell line. Moreover, apoptotic cell death of cancer cells was observed. **Conclusions:** The findings indicate that selected CDF exhibit encouraging antitumor effects; however, additional mechanisms beyond metabolism should be activated by this compound.

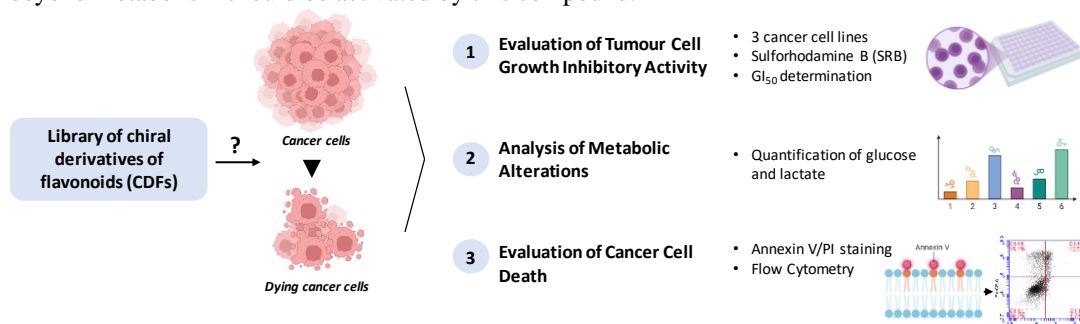


Figure 1. Schematic overview of the experimental approach for evaluating the anticancer properties of chiral flavonoid derivatives (CDFs).

Keywords: chiral derivatives of flavonoids; cancer; multidrug resistance

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