Comparing Cytotoxic Effects of 7-Prenyloxycoumarin Derivatives on Human Leukemia/Lymphoma Cells

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Abstracts

Introduction: Adult T-cell leukemia/lymphoma (ATLL) is an aggressive malignancy of mature activated T cells with poor prognosis, which is mainly due to intrinsic chemoresistance and severe immunosuppression. ATLL shows a distinct geographical distribution that includes southwestern Japan, the Caribbean basin, part of central Africa and north eastern of Iran. 7-prenyloxycoumarins are natural compounds mainly found Rutaceae and Umbelliferae families with valuable pharmacological activities. To introduce a novel and more effective therapeutic modality against ATLL, we evaluated cytotoxic effects of two 7-prenyloxycoumarins on an ATLL cell line.

Methods: Auraptene (AUR) and umbelliprenin (UMB) were synthesized by a reaction between 7-hydroxycoumarin and prenyl bromides, followed by column chromatography to be purified. Then, MT-2 cells were treated with 10 μ g/ml AUR or UMB for 96 h, while cell treated with 0.2% DMSO were considered as control. For viability assessment of cells, resazurin was used and absorption was measured after 2 h at 600 nm.

Results and conclusion: Quantitative assessment of cell viability revealed that 75.2% and 88.6% of cells were alive 4 days after administration of 10 μ g/ml AUR and UMB, respectively. Since AUR induced more cell death, it could be considered as potent toxic agent, while UMB has the potential to be used in combinatorial modalities against ATLL.

Keywords

Adult T-cell leukemia/lymphoma, 7-prenyloxycoumarin, Cytotoxicity, Viability assessment