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Effect of alkylaminophenols on growth inhibition and apoptosis of bone cancer cells

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Abstract

In this work, we report the anticancer properties of a series of 11 chemically synthesized alkylaminophenols against human osteosarcoma U2OS tumor cell line. Several assays including cytotoxicity, inhibitor kinetic study, cell migration, Annexin-V/PI double staining, reactive oxygen species (ROS) and caspase 3/7 assays were conducted on this cell line. Cytotoxic 2-((3,4-Dihydroquinolin-1(2*H*)-yl)(*p*-tolyl)methyl)phenol was determined to have an IC_{50} value of 36.6 µM against U2OS cells and it also inhibits the cell growth in time-dependent manner. The potent activity of lead compound against the growth of multiple cell lines, U2OS, MG-65 and HEK-293T, confirms the osteosarcoma cell specific inhibition. Further studies indicated that such compound is an inhibitor of metastatic property of tumor cells and inducing apoptosis agent. The ability of increasing ROS and inducing caspases 3 and 7 further confirm the contribution of programmed cell death in U2OS and HEK-293T cells. Additionally, four compounds based on the 2-(indolin-1-yl(aryl)methyl)-4-nitrophenol core were also identified to be cytotoxic with IC_{50} values in the 66 - 88 µM range. This work further demonstrates the anticancer properties of phenol derivatives, adding one more entry to the collection of promising chemotherapeutic agents for cancer treatment.

Keywords: anticancer, phenols, cytotoxicity, chemotherapeutic agent.