Abstract:

Background: Cancer is one of the most common diseases today and is one of the main causes of death. **Objectives:** The goal of this study was to design and synthesize a novel series of phenyl-isoxazole-carboxamide derivatives and investigate their anti-tumor and antioxidant activities. **Methods:**Coupling reaction of aniline and isoxazole-carboxylic acid derivatives to produce a series of phenyl-isoxazole-carboxamide derivatives. The novel compounds have been characterized by ^{1}H, ^{13}C-NMR, and IR spectroscopy. The in-vitro evaluation of these compounds was conducted by MTS assay against four cancer cell lines, liver (Hep3b, HepG2), cervical (Hela), and breast (MCF-7) and normal cell line (hek293T), to investigate the anticancer activity. In addition, we measure the antioxidant effectiveness of our compounds by using DPPH assay (2,2′-diphenyl-1-picrylhydrazyl radical). **Results:** All compounds were found to have a potent activity against Hep3B and MCF-7 cancer cell lines, except compound NKH7, which showed weak or negligible activity against Hep3B and MCF-7 cancer cell lines. It was found that the compound NKH1 has potent activity against Hela and Hep3B cancer cell lines with IC_{50} value 0.303 µg/ml and 2.683 µg/ml respectively, the compounds IC_{50} range against Hep3B was 2.196-9.684 µg/ml except NKH7, in comparison with doxorubicin IC_{50} was 1.21 µg/ml , in addition the compounds IC_{50} range against Hek293T was 41.526-88.196 µg/ml , in comparison with doxorubicin IC_{50} was 0.316 µg/ml so we conclude that our compounds show more selectivity against cancer cell in comparison with doxorubicin . Also, all compounds show weak activity as antioxidant agent. the result show that our compounds obey Lipinski's rule of five (RO5) based on information taken from this website (Molsoft L.L.C. (Molecular Properties and Drug-likeness) . **Conclusion:** This is preliminary study to screen this compound as anti-cancer agent, we conclude that our compounds have potent activity against hepatocellular carcinoma and breast carcinoma except NKH 7, and NKH1 show potent activity against cervical cell carcinoma.