# Introduction of potent 2-aryl-1H-phenanthro [9,10-d] imidazole derivatives as cytotoxic agents vs AGS, Hep-G2 and MCF-7 cell Lines

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**Abstarct:**

Some 2-aryl-1H-phenanthro [9,10-d] imidazoles (3a-I) were synthesized for evaluating their cytotoxicity against MCF-7, HepG2, and AGS cell lines using MTT assay. Cell cytotoxic tests showed phenanthramidazoles are very potent cytotoxic agents (IC50 sub-nanomolar). The maximum effect was recorded for 3i against AGS (IC50 0.07 nM). It has also been shown that the phenanthomidazoles were less toxic to HepG2 cells in comparison with MCF-7 and AGS cells. The minimum cell cytotoxicity was reported for 3c in HepG2 cancer cells (IC50 7608.07 nm). Structural studies showed that the synthesized nitrogen/oxygen containing polar groups such as N-acetyl or nitro in para/meta position of the phenyl ring significantly increased the toxicity against AGS cells (3h). A similar trend was observed in the meta nitro derivatives versus MCF-7 (3b, IC50 0.17 nM). It was found that even the weakest cytotoxic compounds exhibited IC50s in low micromolar range whereas most IC50s were lower than the concentration of cis-platin against each cell line. The results of this study showed 2-aryl-1 H-phenanthro [9, 10-d] imidazoles are potential enough structures for more in vivo studies.

**Keywords:** Phenanthro [9, 10-d] imidazoles, Synthesis, MTT assay, Anticancer activity