Title: Comparative cytotoxic studies of new synthesized Pd and Ni complexes against K562 cell line

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Abstract: Application of metal-organic drugs can be useful in cancer treatment because of positive charges of metal centers which can bind with negative charged biomolecules. So, proteins and nucleic acids are the best targets for them. Despite effective clinical effects observed in platinum compound especially cisplatin, there are some severe side effects which suggest to think about some other metals such as palladium, ruthenium, copper, nickel.

Here, we investigated two new designed anti-cancer complex based on [Ni(FIP)2](ClO4)2 and [Pd(Phen)(Pro-gly)]NO3 (where FIP is (2-foran-2-yl) 1H-imidazo-[4,5-f] (1,10-phenanthroline), Pro-gly is propyl-glycine and Phen is 1,10-phenanthroline.), respectively. To analyze the effect of cell death induction of these complexes the model cancer cell line of chronic myeloid leukemia, K562 was as a target. The cells were cultured in RPMI medium supplemented with 15% FBS and 1% Penicillin-streptomycin, and after some passages, different concentrations of complexes (0-120 mM) for incubation time of 24 h.

The cytotoxicity and anti-proliferative properties of the Pd and Ni complexes were evaluated by 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl tetrazolium bromide (MTT) assay. The 50% cytotoxic concentrations (Cc50) of the Pd(II) and Ni(II) complexes were determined 95 and 120 µM, respectively. Results show that the Pd(II) and Ni(II) complexes produced a dose and time – response suppression on growing of K562 leukemia cell lines. Above results suggest that the anticancer metal complex of Pd(II) represent more anti-proliferative activity relative to Ni(II) complex.