Evaluation of antitumor activity of a new binuclear platinum complex in cancer non-small cells

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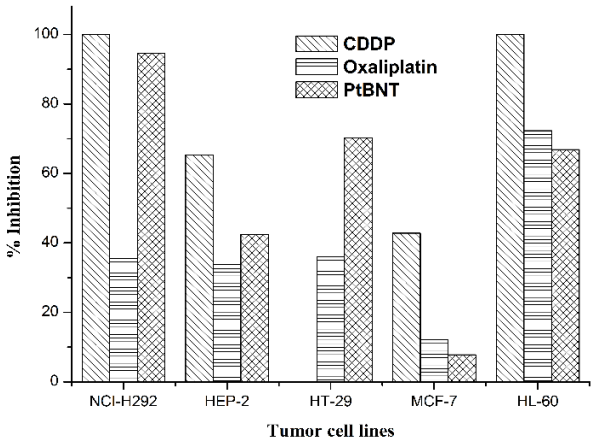
The platinum complexes has received special attention in academic research since the discovery of the antitumor properties of the cisplatin (CDDP), by Barnett Rosenberg in 1969[1,2]. The platinum complexes cytotoxicity is related to the way which they interact with the nDNA, once they reach the interior of the cell. These interactions can be intermolecular; intrastrand or interstrand, this latter shows the most cytotoxic effects[3]. In this work is presented the biological activity of a new binuclear platinum complex, identified as PtBNT, over different strains of tumor cells. The complex PtBNT was characterized using FT-IR, NMR ^{1}H, ^{13}C and ^{195}Pt; and elemental analysis. While its biological activity was tested for the following tumor strains human mucoepidermoid lung (NCI-H292), human laryngeal carcinoma (HEp 2) human colon cancer (HT - 29), human breast adenocarcinoma (MCF-7) and acute promyelocytic leukemia (HL-60). The biological activity of the PtBNT was tested against commercial complexes used worldwide for the cancer treatment, like the CDDP and the oxaliplatin. The results of biological activity (Figure 1) show the high efficiency of the treatment with PtBNT in comparison with the oxaliplatin for the NCI-H292, HEP-2 e HT-29 strains, and similar performance in the treatment of the strain HL-60. The interaction of PtBNT with nDNA, due to binuclear nature of the complex, shows an increase in the cytotoxicity.

Figure 1. Inhibition percentage of CDDP, Oxaliplatin and PtBNT for different cancer cell lines.



The PtBNT complex showed a different activity for the tested strains, it may be associated with the presence of the cation transport proteins (ATP7B)4.[4] The percentage of tumor inhibition, obtained by performing assays in vitro, compared to the cells of (i) acute promyelocytic leukemia (ii) mucoepidermoid carcinoma of human lung and (iii) human colon adenocarcinoma were 79.1, 94.6 and 70.2%, respectively. These results show that the complex can be applied in cancer therapy.

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