

POTENTIAL ANTI-CANCER POLYMERS OF 4-DIHYDROXYBORYL-DL-PHENYLALANINE DERIVATIVES

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ABSTRACT

The aim of this study is obtaining new alternative boron containing polymer carrier to be used for Boron Neutron Capture Therapy. BPA uptake would depend on metabolic status, and preferred backlog in tumor tissue would rely on the comparatively high metabolic activity of tumor cells checked against normal cells (1). The other hand there is a rising interest in the improvement of metallotherapeutic drugs and metal based diagnostic agents during the past 20 years cause of the approved platinum therapeutics (2,3). The elaborations of mechanism of anticancer impression of the platinum and gold complexes may be found in many studies (4,5). In the light of these, the emerges thought is that Pt(II) and Au(III) complexes of BPA derivatives might have more advances for treatment of malign tumors. In this research, firstly original gold complexes of the compounds which are condensation products of 4-dihydroxyboryl-DL-phenylalanine with heterocyclic ligands have been synthesized. The characterization of the intermediate and final compounds arising from this work was carried out by means of a variety of spectroscopic methods, which include ^1H NMR, IR, MS, and elemental analysis. Later than, B-containing copolymer were obtained by copolymerization of dihydroxyboryl-DL-phenylaniline metal complexes in DMF solvent at 65°C under nitrogen atmosphere. Macrobranched derivatives of these polymers were synthesized by the partial grafting. Characterization of macrobranched copolymers were performed by FTIR, ^1H NMR spectroscopy, DSC analyses. As a result of these analyses, it was observed that these macrobranched copolymers had a higher thermal stability than the copolymer. These properties of macrobranched copolymers are explained by self-organized H-bonding effect in radical copolymerization, attacking of metals to dihydroxyboryl due to intermolecular bonds, grafting reactions and by the formation of selfassembled supramolecular architecture.

Key words: 4-Dihydroxyboryl-DL-phenylalanine, metal, complex, polymer

References:

1. Wittig A, Sauerwein WA, Coderre JA. Mechanisms of transport of p-borono-phenylalanine through the cell membrane in vitro. *Radiat. Res.* 2000;153:173–80.
2. Nobili S, Mini E, Landini I, Gabbiani C, Casini A, Messori L. Gold compounds as anticancer agents: chemistry, cellular pharmacology, and preclinical studies. *Med. Res. Rev.* 2010;30:550–80.
3. Liu W, Gust R. Metal N-heterocyclic carbene complexes as potential antitumor metallodrugs. *Chem. Soc. Rev.* 2013;42(2):755.
4. Ano SO, Kuklenyik Z, Marzilli LG. Structure and Dynamics of Pt Anticancer Drug Adducts from Nucleotides to Oligonucleotides as Revealed by NMR Methods. *Cisplatin. Verlag Helvetica Chimica Acta*; 2006:247–91.
5. Bostancıoğlu RB, Işık K, Genç H, Benkli K, Kopalal AT. Studies on the cytotoxic, apoptotic and antitumoral effects of Au(III) and Pt(II) complexes of 1, 10-phenanthroline on V79 379A and A549 cell lines. *J. Enzyme Inhib. Med. Chem.* 2012;27:458–66.