PREPARATION OF NEW PLATINUM-BASED POTENTIAL ANTICANCER DRUGS

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Platinum-based drugs are the most commonly used medicines in cancer treatment. Since the discovery of cisplatin, thousands of platinum complexes have been synthesized and examined for anticancer activity[1]. The main drawbacks of currently used antitumor medicines are side effects and acquired or intrinsic resistance of cancer cells to drugs. To overcome their limitations, new platinum complexes that possess structural fragments designed for encapsulation within macrocyclic cavitands are being prepared. Orally administered, platinum(IV) complexes have been proven to be kinetically more inert than platinum(II) complexes and more stable to acidic media. These prodrugs can be reduced to platinum(II) species and possess higher activity after release of the axial ligands[2]. Their efficacy may be improved by binding to carriers which help with their transport and delivery to the target cancer cells. Encapsulation of platinum(IV) complexes within macrocyclic cavitands enables to prevent complex degradation during transport, reduce side effects, and improve targeting[3].

In this study several novel Pt(II) and Pt(IV) complexes were synthesized. All prepared compounds possess structural fragment to enable their encapsulation within macrocyclic cavitands. Positively charged monofunctional Pt(II) complex containing only one labile site for coordination to DNA was prepared and its interactions with macrocyclic cavitands were studied by ^{1}H NMR spectroscopy. Various leaving groups were installed in axial positions of cisplatin, resulting in the formation of octahedral symmetrical and unsymmetrical Pt(IV) complexes. The compounds were characterized by ^{1}H and ^{195}Pt NMR spectroscopy, IR, Raman, X-ray and ESI-MS measurements.

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