Abstract

The second cause of mortality among the Polish society is cancer. The situation is similar in almost all countries of the world. Currently, platinum (II) compounds play an important role in anti-cancer therapy. Among the drugs from this group, the most commonly used is cisplatin, whose cell cycle inhibiting properties were discovered as early as 1965. Its pharmacological action is to stop the processes of transcription and DNA replication of cancer cells, which leads to their apoptosis. Platinum compounds attack rapidly dividing cells, and therefore they can also have a negative effect on healthy tissues (e.g. bone marrow and hair cells, mucous membranes), and also be neuro- and nephrotoxic. Therefore, there is an intensive search for cytostatics that work more selectively and less toxic than the older generation drugs.

The subject matter described in this thesis is part of the current search for active platinum complexes, as my research has focused on the design and synthesis of new steroid ligands, having in its structure nitrogen atoms which are capable of efficiently binding to platinum ions. This is especially important, because the literature describes only a few platinum steroidal complexes showing the desired antiproliferative properties.

As part of my research, I have developed a method for the synthesis of new steroid derivatives containing amino groups that bind platinum both in the C3 position of the steroid and in the side chain. For the performed syntheses, I used readily available substrates, i.e. cholesterol, bile acids and diosgenin. The selected new complexes were tested for biological properties in cooperation with the Palacky University in Olomouc (Czech Republic). The research results described in this thesis have been described in three international publications and have been presented at numerous foreign and national conferences.

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