boron compounds

Development of albumin-based theranostic conjugates for combining chemotherapy with boron-neutron capture therapy

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Boron-neutron therapy is a method of treating cancer tumors that is developing in Russia. Despite the obvious advantages of this method, such as the possibility of local therapeutic effects, to implement more effective therapy within the framework of BNCT, new therapeutic constructs are needed. For the effective therapy the constructs should combine a sufficient amount of boron, a signaling molecule that allows visualization of the construct within the body and a chemotherapeutic residue for enhancing BNCT with chemotherapeutic effect.

On the platform of human serum albumin, we have created therapeutic constructs carrying boron-containing residues (derivatives of cobalt bisdicarbolide and *closo*-dodecarborate), signaling molecules (Cy5, Cy7, trifluoro acetyl group) and chemotherapeutic residues (analogues of gemcitabine and inhibitors of tubulin synthesis - auristatins MMAE and MMAF). To create the constructs, «click» - chemistry methods were used with application of the polyfunctional reagent homocysteine thiolactone.

The successful preparation of boron-containing polyfunctional constructs has been confirmed by various physico-chemical methods. The toxicity of the created constructs was studied in relation to human glioma cell lines.

Acknowledgments:

This work was supported by the Russian state-funded project for ICBFM SB RAS (grant number 121031300042-1).