Investigation of boron compounds for Boron Neutron Capture Therapy using accelerator based neutron source

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A source of epithermal neutrons based on a tandem accelerator with vacuum insulation and lithium target is created in BINP for development of boron neutron capture therapy of malignant tumors [1, 2]. The neutron beam with the average energy of 10 keV is obtained in prolonged stable operation which is suitable for *in vitro* and *in vivo* studies for BNCT. The beam provides the absorbed dose rate to 0.5 Gy eq./min at 40 ppm of boron-10. The effect of neutron irradiation on the viability of U251MG, T98G, CHO-K1, and V79 cells incubated in boron medium, was studied and a decrease in their survival was shown at increasing the boron concentration [3]. New drugs for targeted delivery of boron-based nanotubes and liposomes was tested. Immunodeficient mice grafted with human glioblastoma were radiated using L-*p*-boronophenylalanine. The report presents and discusses the results of the research and declares the possibility of using accelerator neutron source for research to develop new drugs for targeted delivery of boron for BNCT.

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References

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