IN VITRO AND *IN VIVO* INVESTIGATIONS OF BORON NEUTRON CAPTURE THERAPY

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Boron neutron capture therapy (BNCT) is a promising approach for therapy of human brain tumor. The accelerator-based epithermal neutron source based on novel tandem accelerator with vacuum insulation and lithium neutron producing target was proposed and created in the Budker Institute of Nuclear Physics. Stationary proton beam with 2 MeV energy, 1.6 mA current, 0.1% energy monochromaticity and 0.5% current stability has just been obtained. Neutron generation is realised through 7Li(p,n)7Be reaction. Epithermal neutron flux is formed by Beam Shaping Assembly.

The possibility to use this source for BNCT was tested on a model in vitro and in vivo. Here we present and discuss the results of these investigations. The BNCT effect was demonstrated at neutron radiation of glioblastoma cell line U87 and normal human fibroblast cell line MRC-5 incubated in a medium with and without boron phenylalanine. A proposal to increase the beam parameters to at least 2.5 MeV and 3 mA is discussed. This will allow to fulfil BNCT at the facility at the nearest future.