

BNCT Laboratory in BINP

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A source of epithermal neutrons based on a tandem accelerator with vacuum insulation and lithium target was proposed and constructed in BINP for development of boron neutron capture therapy of malignant tumors. In 2014, with the support of the Russian Science Foundation BNCT laboratory was created in order to be ready to implement BNCT by the end of 2016. The laboratory was equipped by wire scanner probe OWS-30 for ion beam profile measure, activation foils kits SWX-1552 for neutron spectra measure, beam shaping assembly with magnesium fluoride moderator and graphite and lead reflector for neutron beam form, simultaneous ICP atomic emission spectrometers ICPE-9820 for multiple elements analyze and so on. Over the last year the unwanted flow of charged particles in an accelerator was studied and suppressed, its high-voltage strength was improved and proton beam current was increased from 1.6 mA to 5 mA that is sufficient for BNCT. Prolonged stable generation of neutrons with an average current of protons 2.5 - 3 mA was implemented. The effect of neutron radiation on different cell cultures incubated in boron medium, and the viability of the mice grafted with tumor was studied. Fluence of protons leading to the appearance of blisters on the substrate of the neutron generating target was detected. The report presents and discusses the results of the research and declares further plans.