Neutron irradiation of human glioma cultured cells using accelerator based neutron source.

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A modernized source of epithermal neutrons based on a tandem accelerator at BINP was used to irradiate boronophenylalanine (BPA) treated human glioma cells U251 and T98G and chinese hamster cells CHO-K1 and V79. The boron concentrations in the cell samples were measured with inductively coupled plasma atomic emission spectroscopy. Acceptable cellular uptake levels of BPA were observed. The survival of cells was analyzed after irradiation using different neutron fluencies at the same boron concentration (40 ppm) in the growing medium prior the irradiation. In cells pretreated with BPA, colony forming capacity was shown to be inhibited compared with BPA-free cells. Surviving ratios were significantly decreased in a dose-dependent manner in these cell lines, but U251cells were suppressed more strongly than other cells. Our results show that the neutron beam generated by accelerator-based source decreases significantly the viability of tumor cells pretreated with ^{10}B *in vitro*.