

## VEGF TARGETED PROTEIN COATED MAGNETIC NANOPARTICLES FOR BRAIN TUMOR IMAGING

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### Abstract

Magnetic iron oxide nanoparticles (MNP) are widely used in medicine as MRI contrast agents. Especially they can be coupled with tumor specific molecules to be used as a targeted visualization agent for tumors. To create such system we synthesized iron oxide nanoparticles stabilized by molecules of bovine serum albumin and PEG. Magnetization measurements shown their superparamagnetic behavior and saturation magnetization value 55 emu/g. Average size of this MNP was 40nm by DLS and TEM analysis. Protein content was evaluated by TGA and equals to 40%. T2 relaxivity reaches value of 160 mM<sup>-1</sup>s<sup>-1</sup>. This MNP were conjugated with monoclonal antibodies to VEGF for targeted delivery to brain tumor. After conjugation this MNP had shown better affinity to glioma C6 cells in in vitro experiments than conjugated with non specific IgG. By MRI in SWI regime we have shown enhanced contrast of tumor vasculature of rats bearing experimental rat glioma C6 for both targeted and nontargeted MNP due to defective vessels in tumor. However enhanced accumulation of targeted MNP at tumor region was observed after 24 h only for targeted MNP, thus allowing to specifically visualize tumor areas with VEGF overexpression.

**Keywords:** Iron oxide nanoparticles, MRI, glioblastoma, VEGF

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