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Development of self-regulating thermosensitive magnetic nanoparticles ANNA KUKLINA, CHAMATH DANNANGODA, KAREN MARTIROSYAN, The University of Texas at Brownsville — In oncology, the term "magnetically induced hyperthermia" refers to the type of cancer treatment in which the heat is generated by the response of administered ferrofluid to alternating magnetic field. Malignant tumors are more susceptible to the damaging effects of heat within the rage of 40-44 °C that healthy tissue. However, major limitation associated with hyperthermia cancer treatment is the difficulty of temperature control, due to uneven distribution of magnetic particles and variations in tissue heat conductivity that results in localized overheating of healthy tissue. The focus of this project is the development of self-regulating thermosensitive magnetic nanoparticles, which would lose the magnetic moment when temperature reaches the upper limit of biologically tolerable range. The reduction of the Curie temperature of the magnetic fluid can be accomplished by doping superparamagnetic iron oxide nanoparticles with various biocompatible oxides, such as zinc, titanium, and magnesium. Described approach would make hyperthermia treatment minimally invasive and reduce associated side effects.

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