Conference Abstract Proceedings

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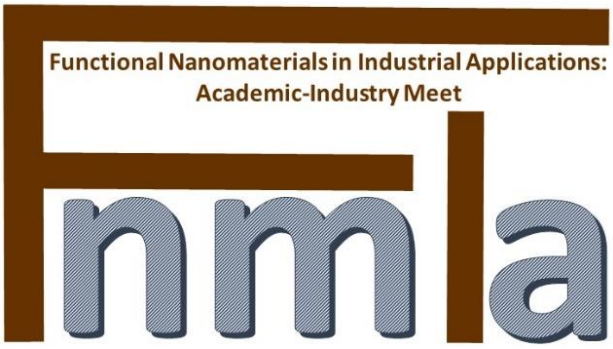

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Development of Novel Approaches for Tumour Therapy based on Nanostructured Materials - MagBioVin Project

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ABSTRACT

Research advancements and opportunities by the FP7-ERA Chairs project MagBioVin are spotlighted.[1] Topic of the project is the design of different novel magnetic nanoarchitectures (e.g. bimagnetic and polymeric core-shell systems, nanoparticles embedded in mesoporous silica structures, and radiolabeled nanostructures)[2–4] for application in targeted treatment and diagnostics of cancer. These nanomaterials posses the ability for selective treatment of tumor tissues by the targeting with magnetic field.[5,6] Alternating magnetic field also provides the means for hyperthermia-induced cancer treatment.[7]Attachment of radionuclides to the synthesized nanoparticles is explored for the purpose of imaging and internal radiotherapy.[8,9] Magnetic characteristics of the prepared nanomaterials is done by SQUID magnetometry and Mössbauer spectroscopy. Structural characterization of the investigated nanomaterials is performed by XRD, TEM imaging, DRIFT spectroscopy, and nitrogen sorption analysis. Magnetic hyperthermia effects are monitored by using commercial setup (nB nanoScale Biomagnetics) which includes applicators for cell cultures and small animals.
In vitro and *in vivo* (animal model) applicability of the synthesized nanomaterials regarding toxicity, biodistribution and anti-cancer efficacy is explored for targeted cancer treatment.

Keywords: MagBioVin, magnetic hyperthermia, radiolabeling, magnetic nanoparticles, core shell.

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