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Dendrimer coated SPIONs for exploring biomedical applications

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Dendrimers are nanosized, radially symmetric molecules with well defined, homogeneous monodispersed structure with symmetric core, an inner and outer shell. They make a suitable choice to coat SPIONs Super Paramagnetic Iron Oxide Nanoparticles (SPIONs, Fe_3O_4). SPIONs were prepared by chemical co-precipitation method using microwave synthesizer which enhances the rate of synthesis and chemical reactions. The surface of these SPIONs was modified by 3-amino propyl triethoxy silane (APTES) for dendrimer coating which improves magnetic properties and size distribution. Dendrimers were synthesized using divergent method of synthesis. Polyamidoamine (PAMAM) dendrimer is coated to Fe_3O_4 core to prepare PAMAM- Fe_3O_4 core-shell nanostructures through Michael reaction. Studies show that 4th generation PAMAM dendrimers are effective phase transfer agents for SPIONs from organic media to water. These SPIONs were characterized using suitable techniques and their biological compatibility was studied using MTT assay and simple staining techniques on mouse fibroblast 3T3 cell line. Such type of functionalized SPIONs can be projected for their biomedical applications. They are already being used for their magnetic properties. They are a suitable candidate for improving the contrast in MRI imaging. Surface modification of such SPIONs opens greater dimensions to their applicability in biological arenas of research.

Biography

Navjeet Kaur B Lotey is pursuing her PhD from Ramnarain Ruia College, Mumbai in an interdisciplinary area of Nanoscience. She has three publications in peer reviewed journals arising from her previous project works. She is currently working on functionalization of magnetic nanoparticles and their use in biomedicine technology.

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