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CHARACTERIZATION AND BIOAPPLICATION OF MAGNETIC NANOPARTICLES

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Magnetic nanoparticles (NPs), especially SPIO nanoparticles, have long been used as MRI (Magnetic Resonance Imaging) contrast agents and as advantageous nanoplatforms for drug delivery, taking advantage of their unique magnetic properties and ability to function at the molecular and cellular level. In our centre smart design and development of SPIO nanoparticles in mild conditions with desired physico-chemical properties (size, composition, surface modification, magnetization, relaxivity, biocompatibility, etc.) have been performed to fulfil desired bioapplication. In this lecture the most promising results will be presented and consequently discussed advanced in vitro and in vivo MRI application of such prepared SPIO nanomaterials or nanocomposites. The particular attention will be devoted to labeling and MRI detection of stem cells, and potential clinical application of maghemite/bentonite nanocomposite as an per-oral contrast agent.

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