

## Core@Shell Fluorescent-Magnetic Glyco-ferrites as Specific Targeted Contrast Agents for Magnetic Resonance Imaging

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Magnetic resonance imaging (MRI) has been used for several years for non-invasive medical diagnostic. Until now its use in clinics has been based on non-specific contrast agents, but nowadays a fast shift towards specific targeted agents is taking place. In order to prepare these specific probes a careful design of the new contrast agents is needed. Our group has experience in preparing gold and magnetic nanoparticles for their application as T<sub>1</sub> and T<sub>2</sub> MRI contrast agents.<sup>1,2</sup>

We present here superparamagnetic glyconanoparticles designed to specifically label cells, tissues or organs. For the preparation of the magnetic nanoparticle platform we have selected the thermal decomposition methodology<sup>3</sup> followed by deposition of a gold shell<sup>4</sup> in non-polar solvents. To render these nanoparticles water soluble a ligand exchange reaction with amphiphilic sugar conjugates and carboxylic linkers was performed. The carbohydrates confer the nanoparticles interesting properties as biocompatibility, lack of immunogenicity and reduction of non-specific adsorption. To the carboxylic group protein G and a fluorescent dye were coupled. Protein G guarantees the well-oriented capture of antibodies. High specificity was achieved by choosing antibodies (Ab) as targeting molecules.

Finally the ability of these glyconanoparticles to label specifically cell populations was tested both by MRI and by fluorescence techniques with two different cell lines and with a complex real biological media as blood.

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