Supplementary Information

Efficient Strategy to Increase the Surface Functionalization of Core-Shell Superparamagnetic Nanoparticles using Dendrons Grafting

Karine Heuzé,* Daniel Rosario-Amorin, Sylvain Nlate, Manuel Gaboyard, Anthony Bouter, Rodolphe Clérac

Characterizations. The $^1$H, $^{13}$C and $^{31}$P NMR spectra were recorded using the following spectrometers: A Brucker DPX 200 FT NMR spectrometer ($^1$H: 200.16 and $^{13}$C: 50.33 MHz), a Brucker AC 250 FT NMR spectrometer ($^1$H: 250.13 and $^{13}$C: 62.90 MHz) and an Avance 300 FT NMR spectrometer ($^1$H: 300.13 and $^{13}$C: 75.46 MHz). The elemental analyses were performed with ThermoFischer Flash EA1112. Thermogravimetric analyses (TGA) were done on dried samples under argon atmosphere with a heating rate of 5 °C/min on a Netzsch STA-409 C/CD. Transmission Electron Microscope Images (TEM) images have been obtained on Cu/C supports on a JEOL JEM 2000FX electron microscope operated at 200 kV. Confocal microscopy analyses: Nanoparticles have been diluted in ultrapure water and deposited on 8-well Labteck plates (Nale Nunc International). Images have been collected on a Leica TCS SP2 AOBS microscope (Leica Microsystems, Heidelberg, Germany) with an HCX PL APO CS 63.0 x 1.40 oil objective at room temperature. The following microscope settings have been applied: 0.1 mL of a diluted (1/10) sample solution of FITC-nanoparticles were excited with the 488 nm laser line (intensity set at 30% of maximal power) and their emission observed between 500 and 545 nm (pinhole 1.00 airy). Photomultipliers detectors voltage values have been set as hereafter: the threshold values (offset) have been adjusted with the Q-LUT mode and the maximal signal amplification value (gain) was determined on a sample containing non-fluorescent nanoparticles. Flow cytometry measurements: Nanoparticles have been diluted in ultrapure water before analysis. Flow cytometry histograms have been recorded on a Cytomics FC500 instrument (Beckman Coulter, Fullerton, USA). The magnetic susceptibility measurements have been obtained with the use of a Quantum Design SQUID magnetometer MPMS-XL. This magnetometer works between 1.8 and 400 K for dc applied fields ranging from -7 to 7 T. Measurements have been performed on finely ground crystalline samples of 6.89 and 4.75 mg for D1 and D2. The magnetic data have been corrected for the sample holder and the diamagnetic contribution.

Figure S1. Images (48 x 48 μm) of aggregate sample observed by confocal (left) and optical (right) microscopy. Grafting conditions are reported in Table 1, entry 9.
**Figure S2.** The magnetization curves of D2 dendrons grafted γ-Fe₂O₃ Carboxyl-Adembeads 300 nm nanoparticles (synthesized respectively as described in table 1, with 0.15 μmol D2/ mg particles) :