Supplementary data

Silica-F127 Nanohybrid-encapsulated Manganese Oxide Nanoparticles for Optimized T1 Magnetic Resonance Relaxivity

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Fig. S1 X-ray diffraction trace of MnO nanoparticles (MONPs). The average crystallite size of MONPs (d = 14.4nm) is calculated using the Debye-Scherrer formula.
Fig. S2 Figure S2: FT-IR spectra of oleic acid, manganese oleate and the as-synthesized MONPs. The four characteristic bands of oleyl group –OOC–(CH₂)₇–CH=CH–(CH₂)₇–CH₃ are observed. While the bands at 1555 cm⁻¹ and 1410 cm⁻¹ can be assigned to the asymmetric and symmetric stretching modes of the carboxylate group, the bands at 2925 cm⁻¹ and 2854 cm⁻¹ are due to the symmetric and asymmetric stretching of the CH₂ bond.
**Fig. S3** Hydrodynamic size distribution of PEO/SiO$_2$-encapsulated MONPs (PEOMSN), measured by dynamic light scattering (DLS). The average hydrodynamic diameter was determined to be 76.4 nm.

**Fig. S4** Wide-scan XPS spectrum of the as-prepared PEOMSN. The inset shows a high-resolution XPS scans of the Mn 2p region.
Fig. S5 Mn-ion leaching experiments. The increase in Mn content of the supernatant of PEOMSN was determined over time.

Fig. S6 TEM images of PEOMSN after 16-hours acidic etch in an acetate buffer solution. Formation of hollow cavities within the encapsulated MONPs is observed.