

## Supporting Information

### **Microwave-assisted one-step synthesis of water-soluble manganese-carbon nanodot clusters**

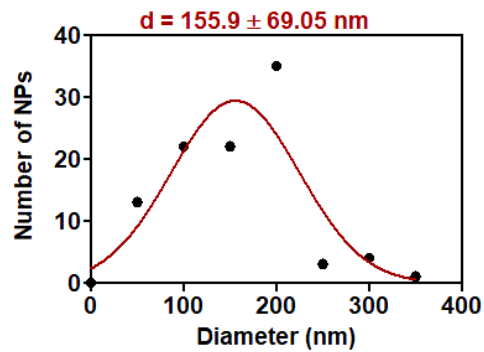
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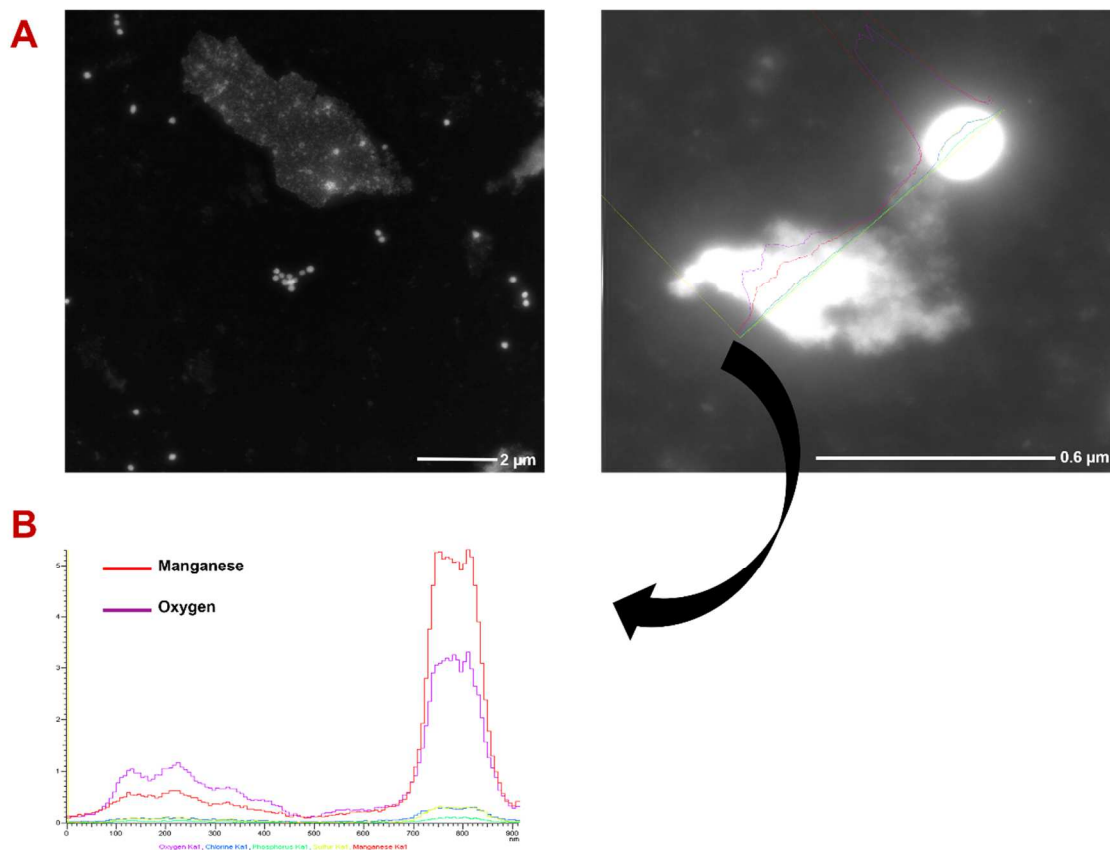
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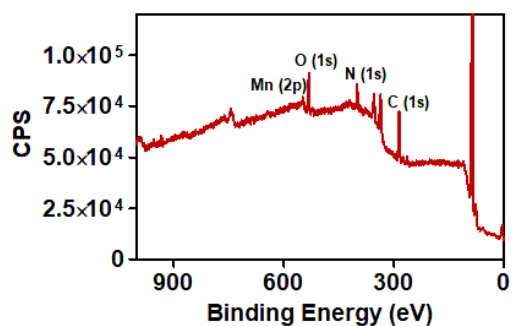
E-mail: [prato@units.it](mailto:prato@units.it)



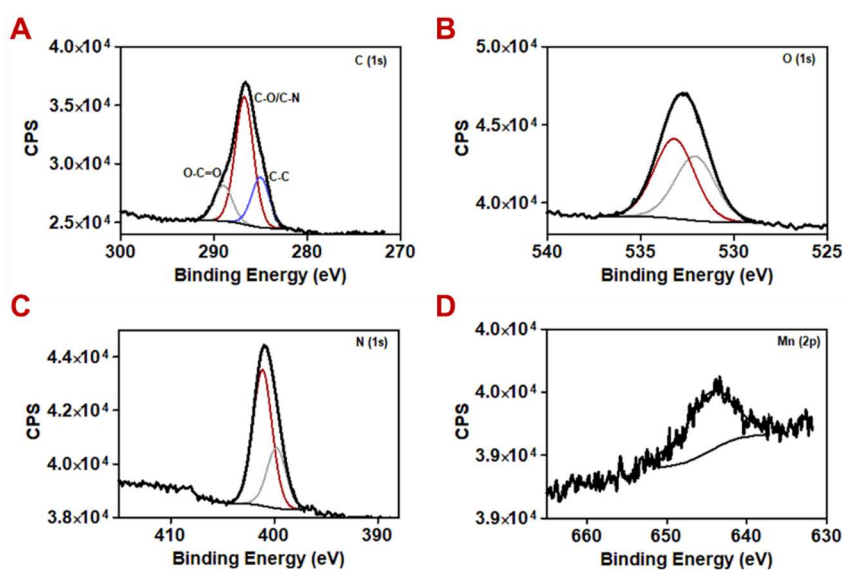
**Figure S1.** Average size distribution of a freshly prepared sample of **Mn-CND-Cs 1** in water as determined by TEM.



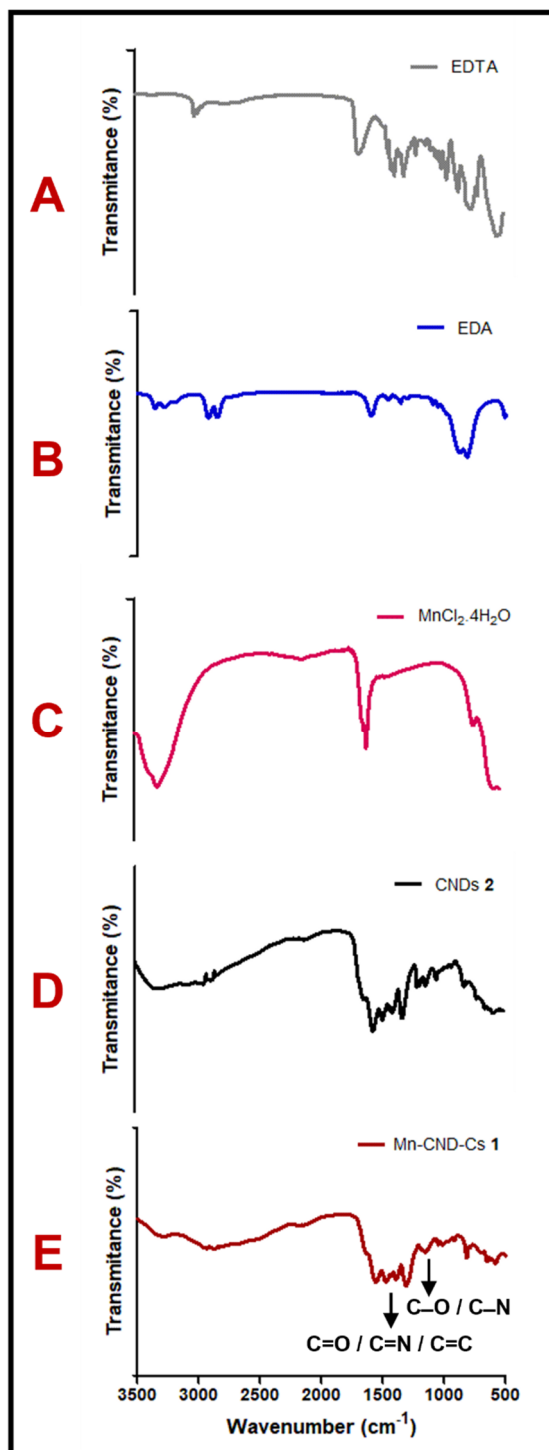
**Figure S2.** Representative HAADF-STEM images (A) and EDX line elemental map of corresponding O and Mn (B) of **Mn-CND-Cs 1** in water.



**Figure S3.** XPS survey of **Mn-CND-Cs 1**.



**Figure S4.** Deconvoluted XPS spectra of **Mn-CND-Cs 1**: (A) C 1s, (B) N 1s, (C) O 1s and (D) Mn 2p.



**Figure S5.** FTIR spectra of EDTA (A), EDA (B),  $\text{MnCl}_2 \cdot 4\text{H}_2\text{O}$  (C), CNDs 2 (D) and **Mn-CND-Cs 1** (E) in KBr.

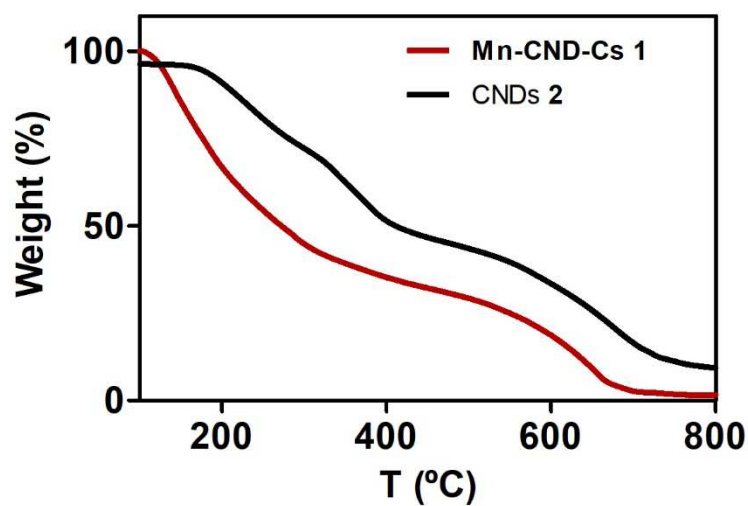


Figure S6. TGA curve of **Mn-CND-Cs 1** and **CNDs 2** under nitrogen atmosphere.

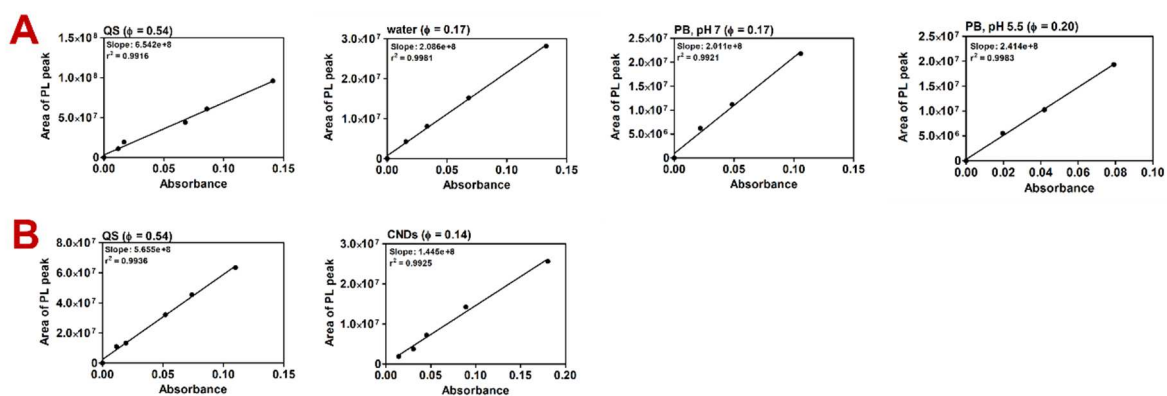
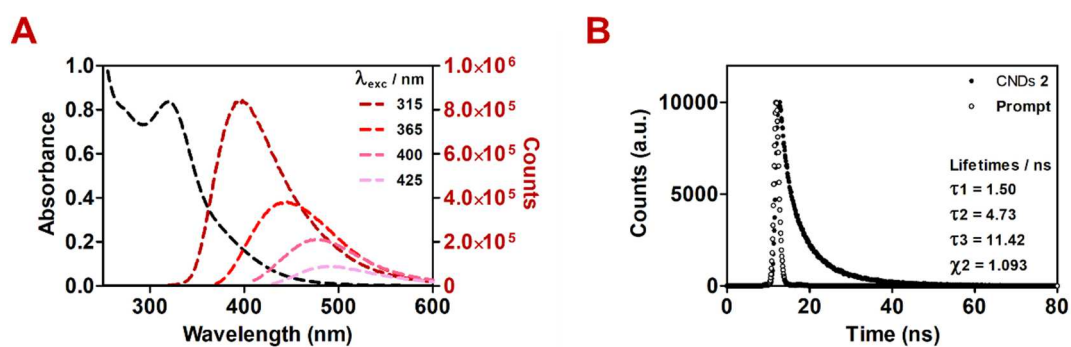
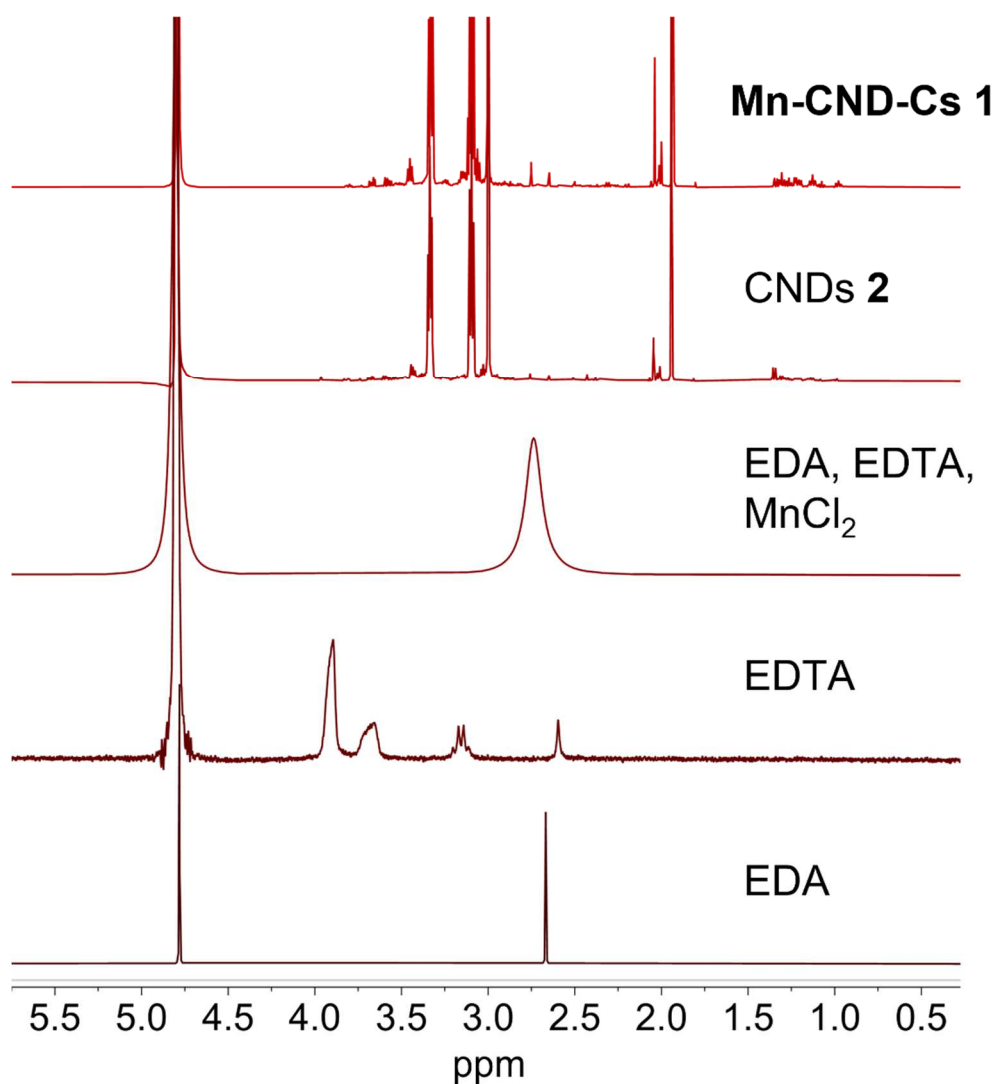


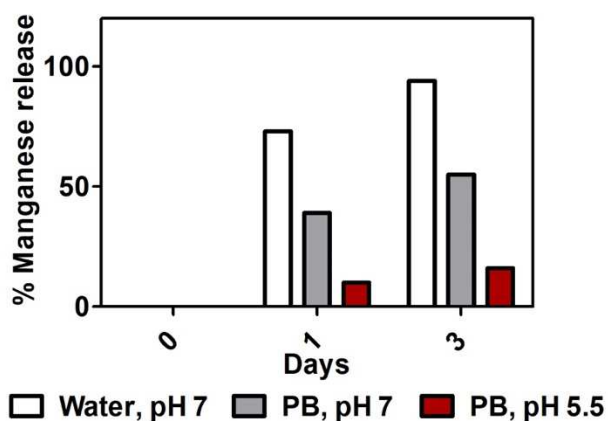
Figure S7. Quantum yield ( $\Phi$ ) obtained using quinine sulfate (QS) as the reference for A) **Mn-CND-Cs 1** in water and in PB at two different pH values (7 and 5.5) and B) **CNDs 2**.



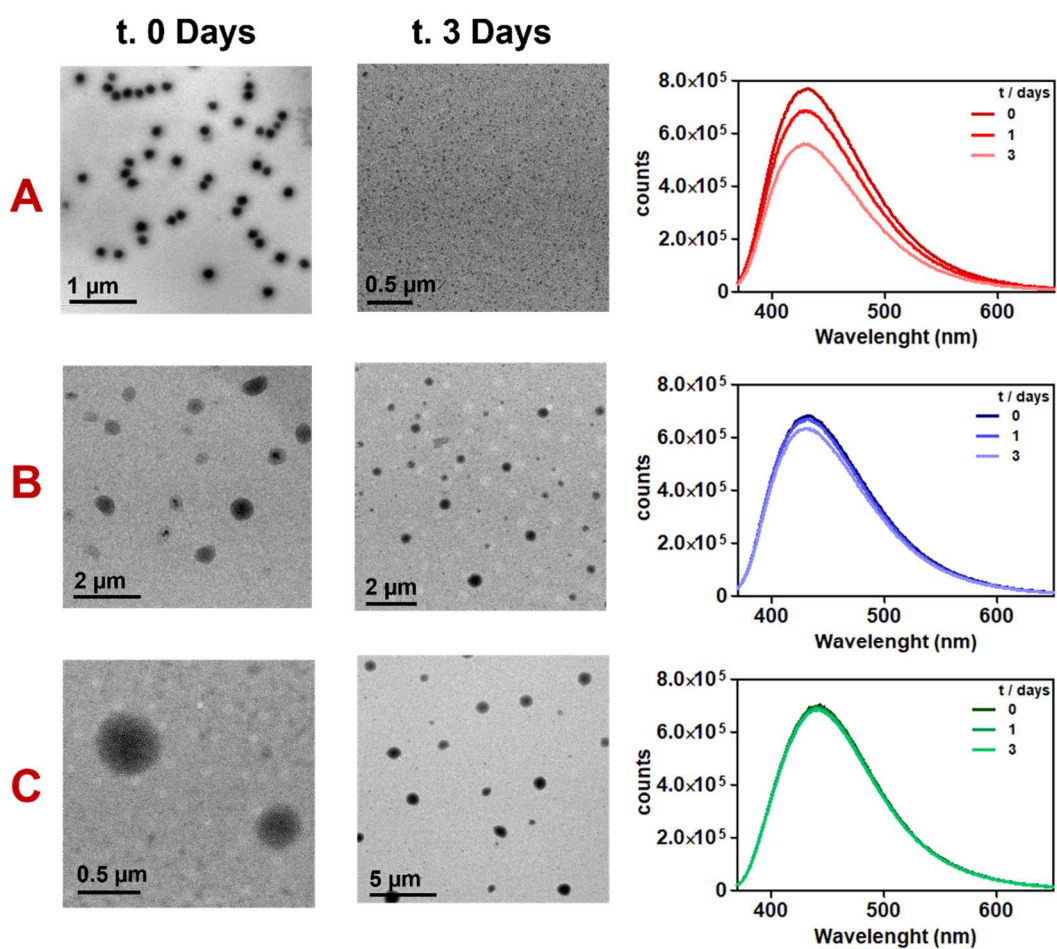
**Figure S8.** A) UV-Vis absorption spectrum (black) and fluorescence spectra (colored) of CNDs **2** in water (298 K) at different excitation wavelengths and B) time-resolved fluorescence-decay curve of CNDs ( $\lambda_{exc} = 340$  nm) of the emission band at 409 nm.



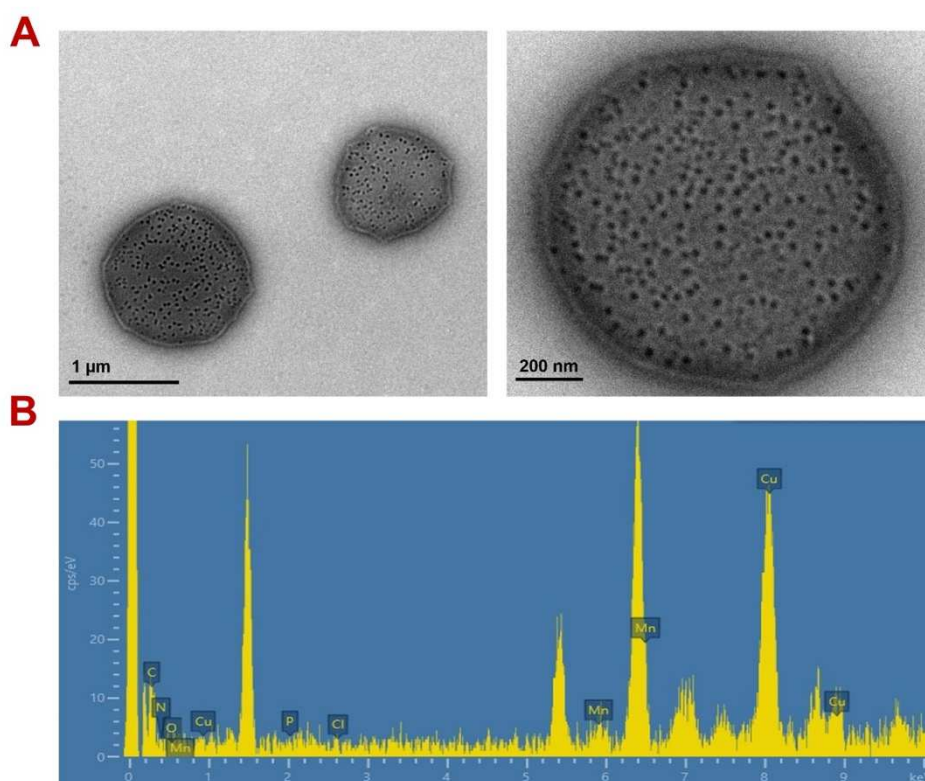
**Figure S9.**  $^1\text{H-NMR}$  spectra of Mn-CND-Cs **1**, CNDs **2**, and synthesis precursors in deuterium oxide.



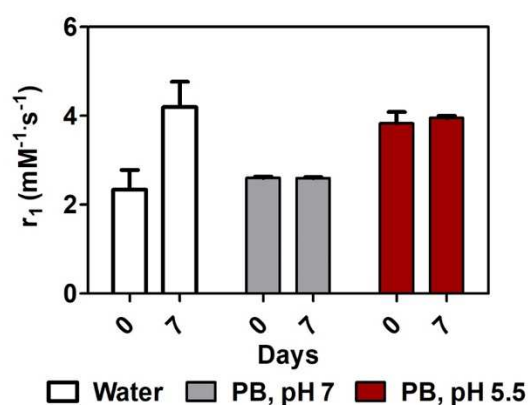
**Figure S10.** Time course of Mn release from **Mn-CND-Cs 1** in water and in PB at two different pH values, pH = 7 and 5.5.



**Figure S11.** TEM images and fluorescence spectra ( $\lambda_{\text{exc}} = 365 \text{ nm}$ ) of **Mn-CND-Cs 1** recorded in water (A) and in PB at pH 7 (B) and pH 5.5 (C) over time.



**Figure S12.** High-resolution TEM images (A) and EDX (B) of **Mn-CND-Cs 1** in PB at pH 5.5 (30% of DMF).



**Figure S13.** Longitudinal relaxivity value ( $r_1$ ) obtained for a fresh stock of **Mn-CND-Cs 1** in water and in PB at two different pH values (pH = 7 and 5.5) and after 7 days in solution. Bar graphs with errors bars show the mean and standard deviation of at least 3 values of  $r_1$  obtained for different fresh samples of **Mn-CND-Cs 1** in water and in PB at two different pH values (pH = 7 and 5.5) and after 7 days in solution.