

Supplementary Information

PEG-MWCNT/Fe hybrids as multi-modal contrast agents for MRI and optical imaging

Anna Baranowska-Korczyc ^{a, *}, Małgorzata Jasiurkowska-Delaporte ^{a, *}

Barbara M. Maciejewska ^{a, b}, Alicja Warowicka ^a, L. Emerson Coy ^a, Tomasz Zalewski ^a,
Krzysztof K. Koziol ^c, Stefan Jurga ^{a, b}

^a NanoBioMedical Centre, Adam Mickiewicz University, ul. Umultowska 85, PL-61614 Poznań, Poland

^b Department of Macromolecular Physics, Faculty of Physics, Adam Mickiewicz University, Umultowska 85, PL-61614 Poznań, Poland

^c University of Cambridge, Department of Materials Science and Metallurgy, 27 Charles Babbage Road, Cambridge CB3 0FS, UK

* Corresponding authors: akorczyc@amu.edu.pl (A. Baranowska-Korczyc), maljas@amu.edu.pl, (M. Jasiurkowska-Delaporte)

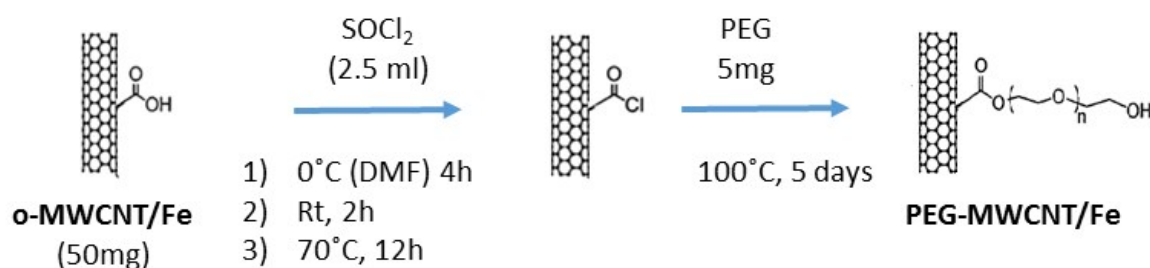


Figure 1. Synthesis of PEG-MWCNT/Fe hybrids.

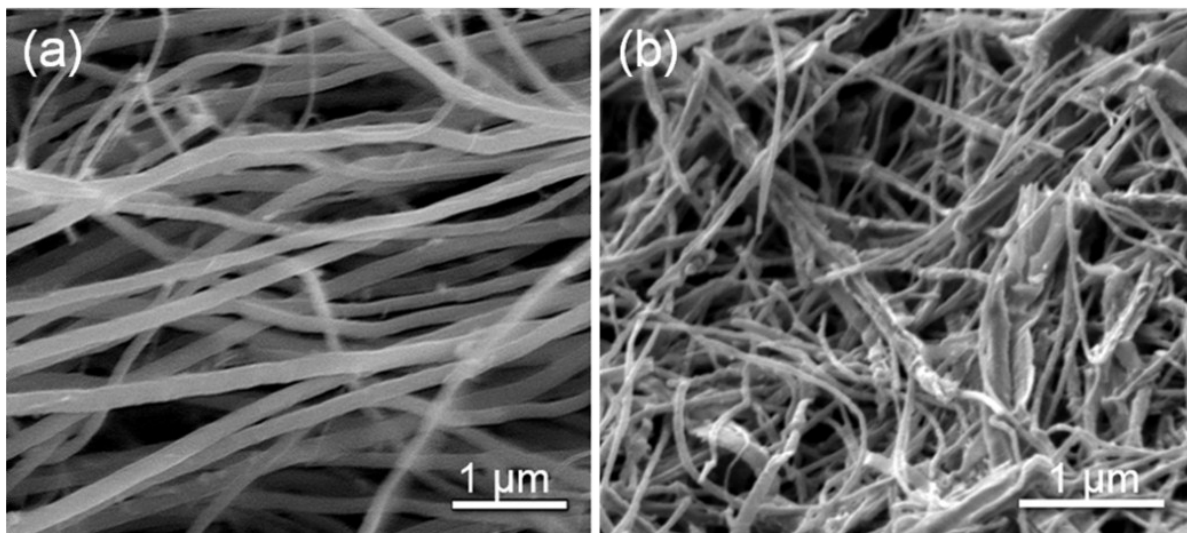


Figure 2. SEM images of MWCNTs (a) oxidized and (b) functionalized with PEGs with a molecular weight of 400.

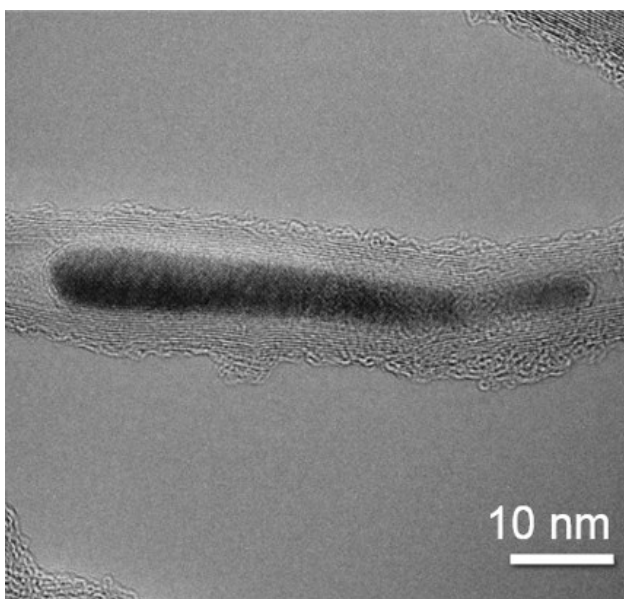


Figure 3. TEM image of Fe particle embedded in MWCNT functionalized with PEGs with a molecular weight of 2000.

C-O, C-C stretching+ CH ₂ rocking mode				1073	1073	1071	1073	1072	1070	1073	1073	1071
C-O, C-C stretching + CH ₂ rocking mode		1059		1042	1041	1039	1040	1040	1039	1040	1042	1039
CH ₂ rocking + CC, OC stretching	950	960	960	966	967	962	966	964	963	967	967	964
		944	944									
OH	885			882	889	889	886	886		885	882	886
	837	840	840	842	842	836	840	842	840	837	845	
C=O rocking + CH ₂ rocking	-			775	772	774	772	772	771	775	772	774
O-C=O in plane deformation	-			744	743	744	743	744	743	743	744	745
O-C=O in plane deformation	-			701	704	702	705	705		705	704	

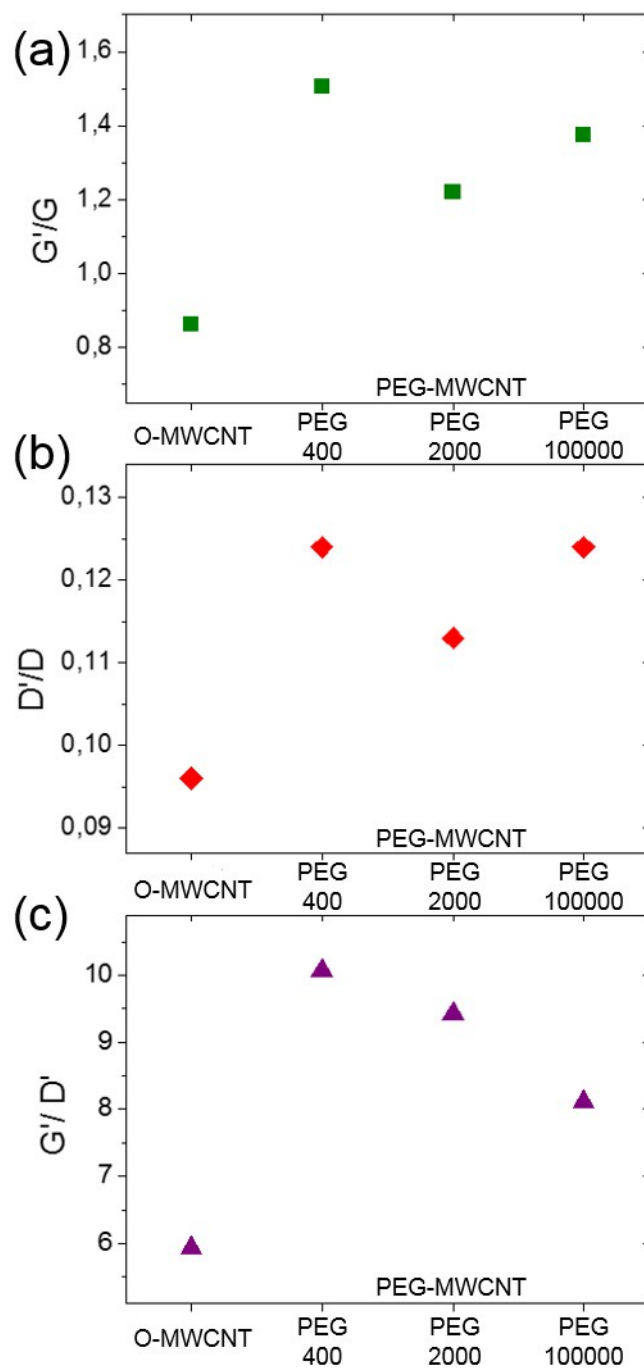


Figure 4. Values of integrated intensity ratios of characteristic Raman bands (a) G'/G , (b) D'/D and (c) G'/D' for MWCNTs with a mean diameter of 40 nm, modified with PEGs with molecular weights of 400, 2000 and 100000.

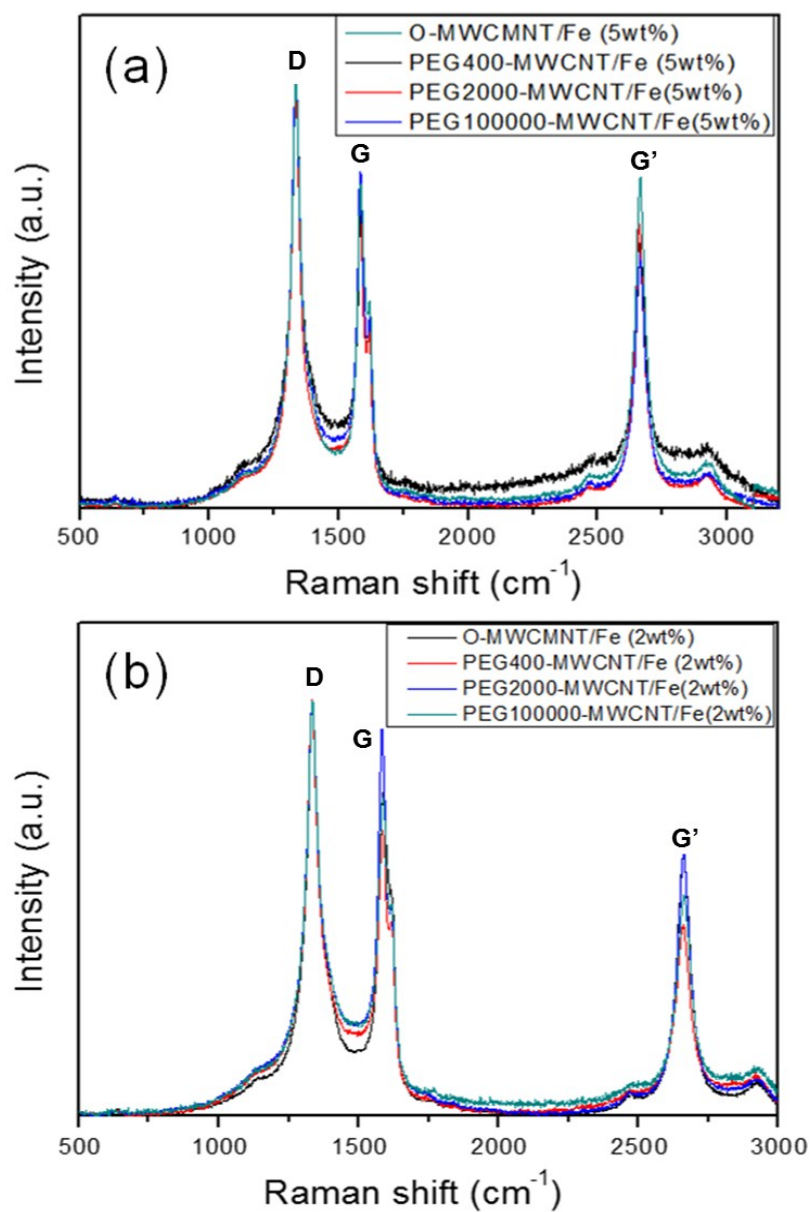


Figure 5. Raman spectra of oxidized and functionalized with PEG of different molecular weight (Mw: 400, 2000 and 100000) MWCNTs with mean diameter of (a) 50 nm and (b) 30 nm.

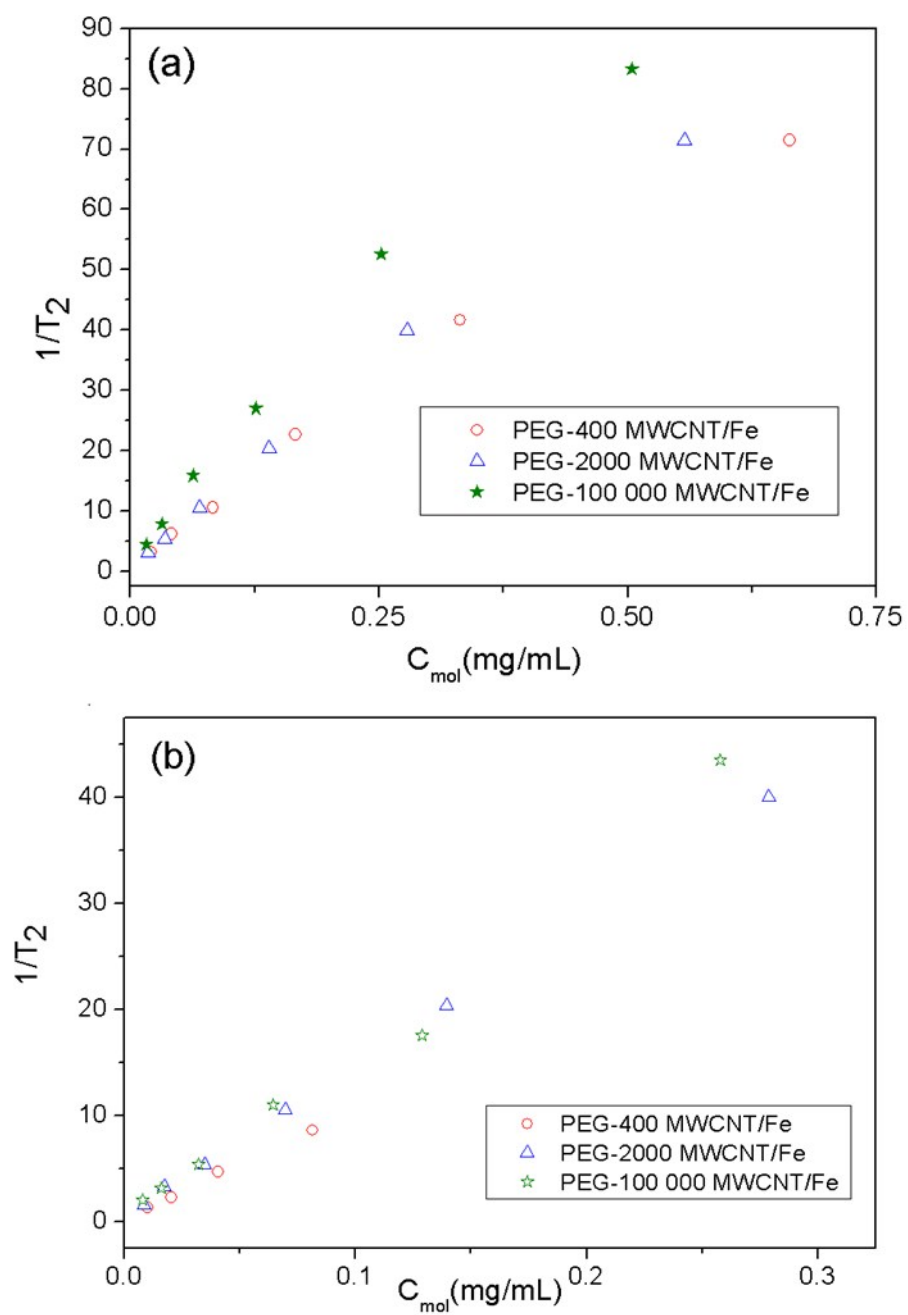


Figure 6. The $1/T_2$ as a function of concentration of MWCNTs with mean diameter of a) 40 and b) 50 nm dispersed in water.

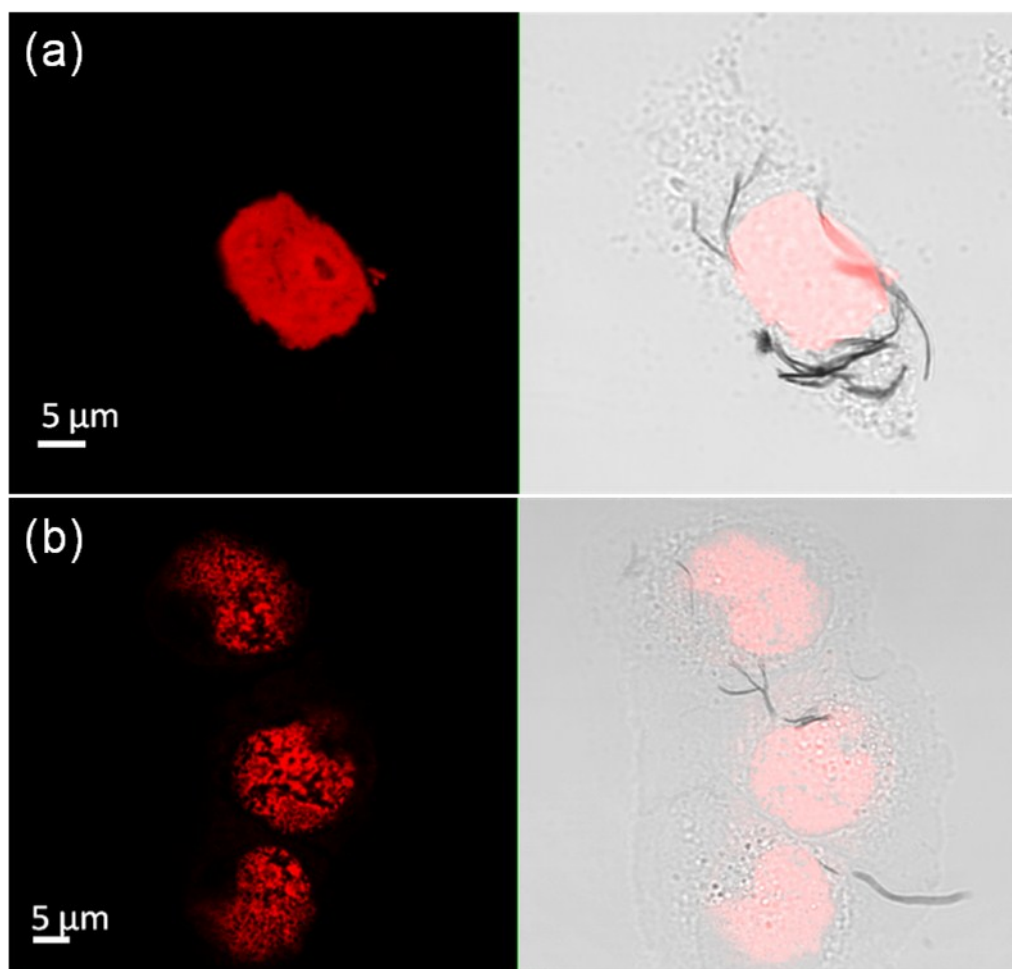


Figure 7. Confocal images of (a) PEG-MWCNT/Fe and (b) O-MWCNT/Fe (6μg/ml) hybrids internalized inside HeLa cells (after transfection with histone H2B-RFP plasmid, ex. 635 nm, em. 655-755 nm).

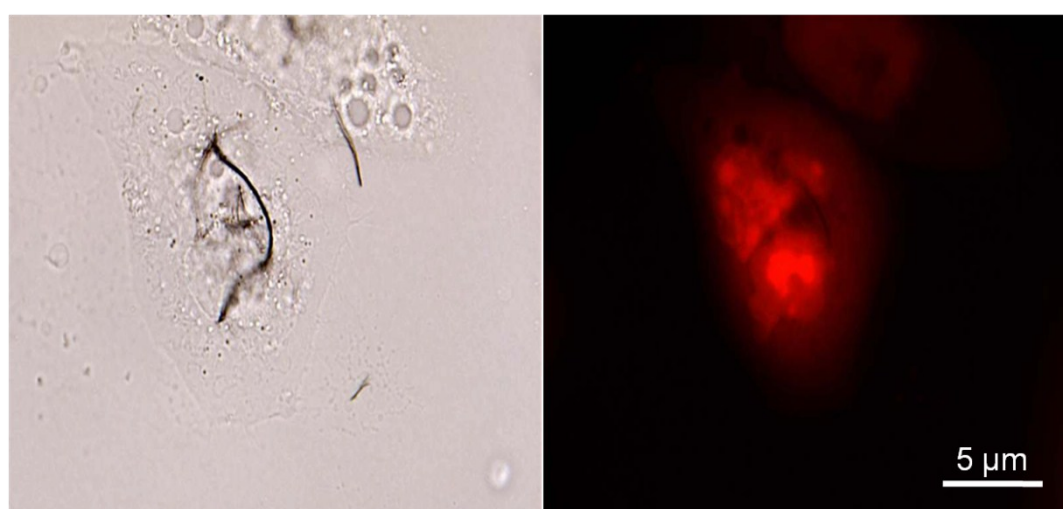


Figure 8. Confocal images of PEG-MWCNT nanostructure internalized inside HeLa cells (after transfection with histone H2B-RFP plasmid, ex. 635 nm, em. 655-755 nm).

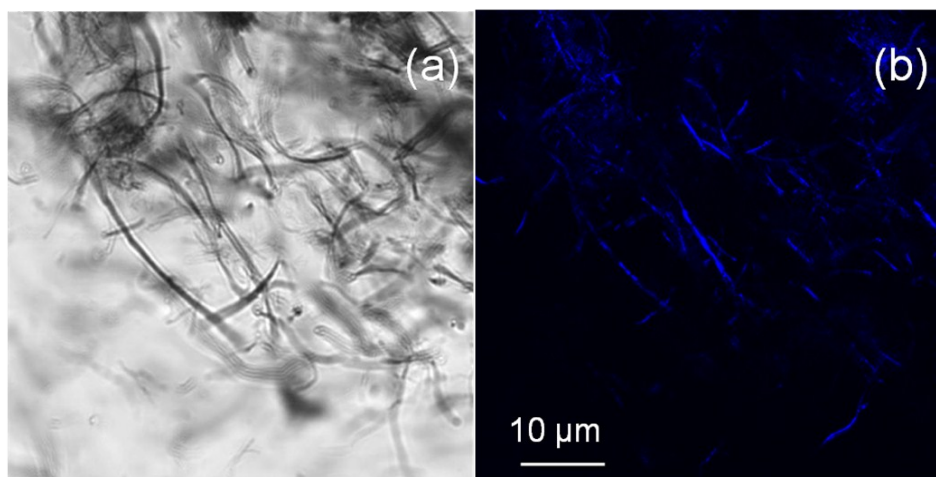


Figure 9. (a) Light and (b) confocal images of PEG-MWCNT/Fe labeled with DAPI (ex. 405 nm, em. 415-515).