Supporting Information

Multiplexed Imaging of Therapeutic Cells with Multispectrally Encoded Magnetofluorescent Nanocomposite Emulsions

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Complete List of authors for Reference 16

Geiss, G. K.; Bumgarner, R. E.; Birditt, B.; Dahl, T.; Dowidar, N.; Dunaway, D. L.; Fell, H. P.; Ferree, S.; George, R. D.; Grogan, T.; James, J. J.; Maysuria, M.; Mitton, J. D.; Oliveri, P.; Osborn, J. L.; Peng, T.; Ratcliffe, A. L.; Webster, P. J.; Davidson, E. H.; Hood, L. *Nat. Biotechnol.* **2008,** 26, 317-325.

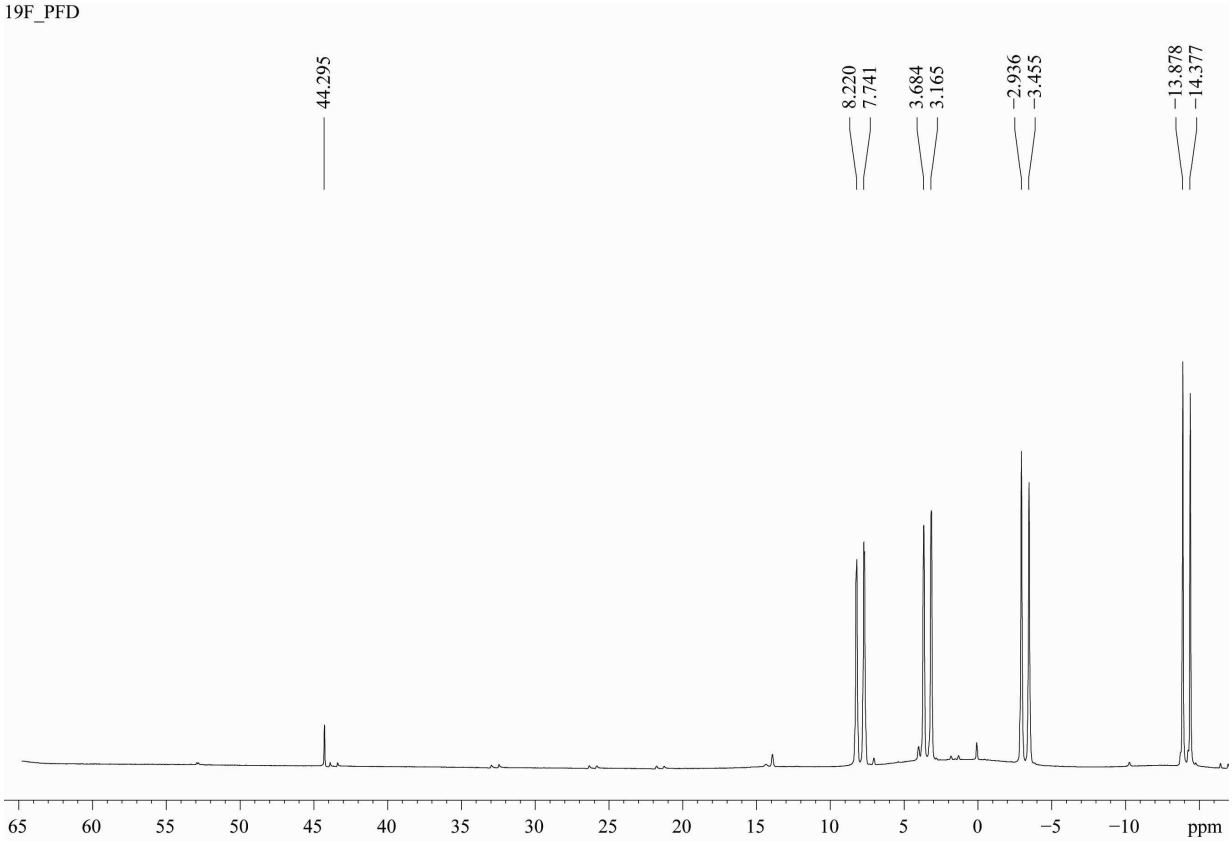


Figure S1. ^{19}F -based MR spectrum of PFD.

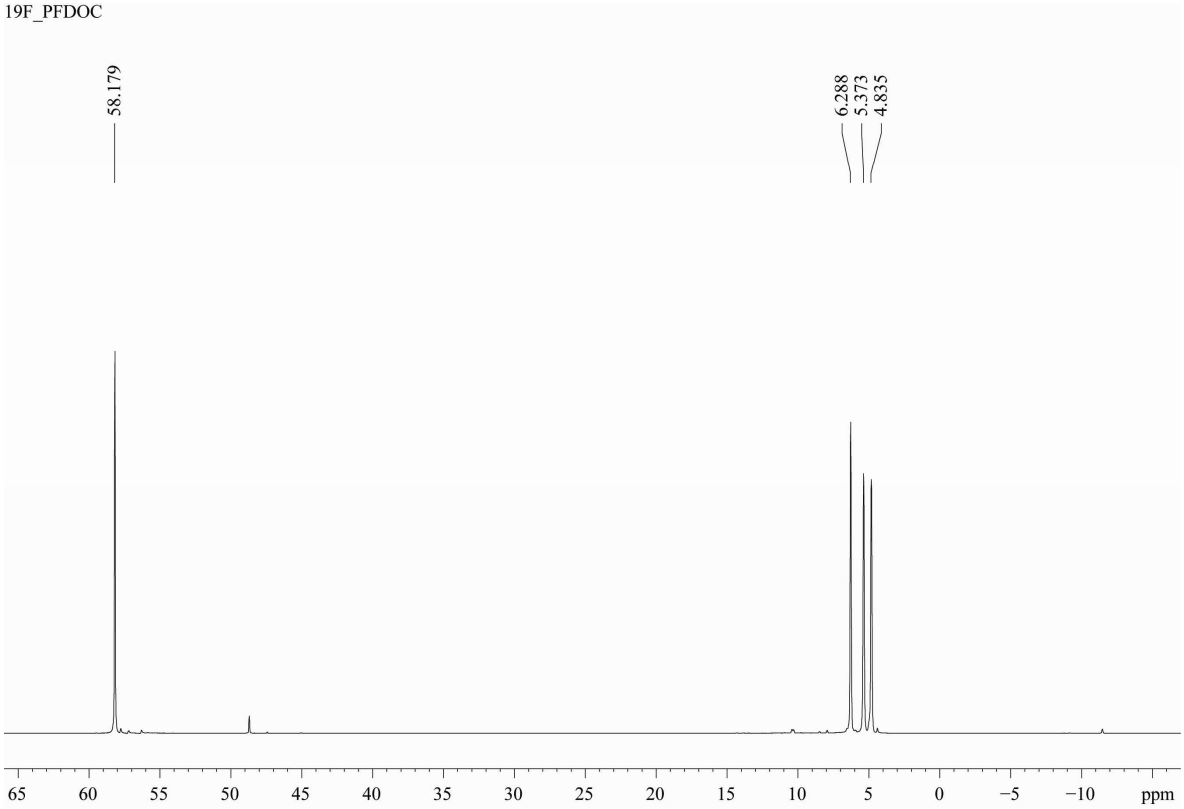


Figure S2. ^{19}F -based MR spectrum of PFDOC.

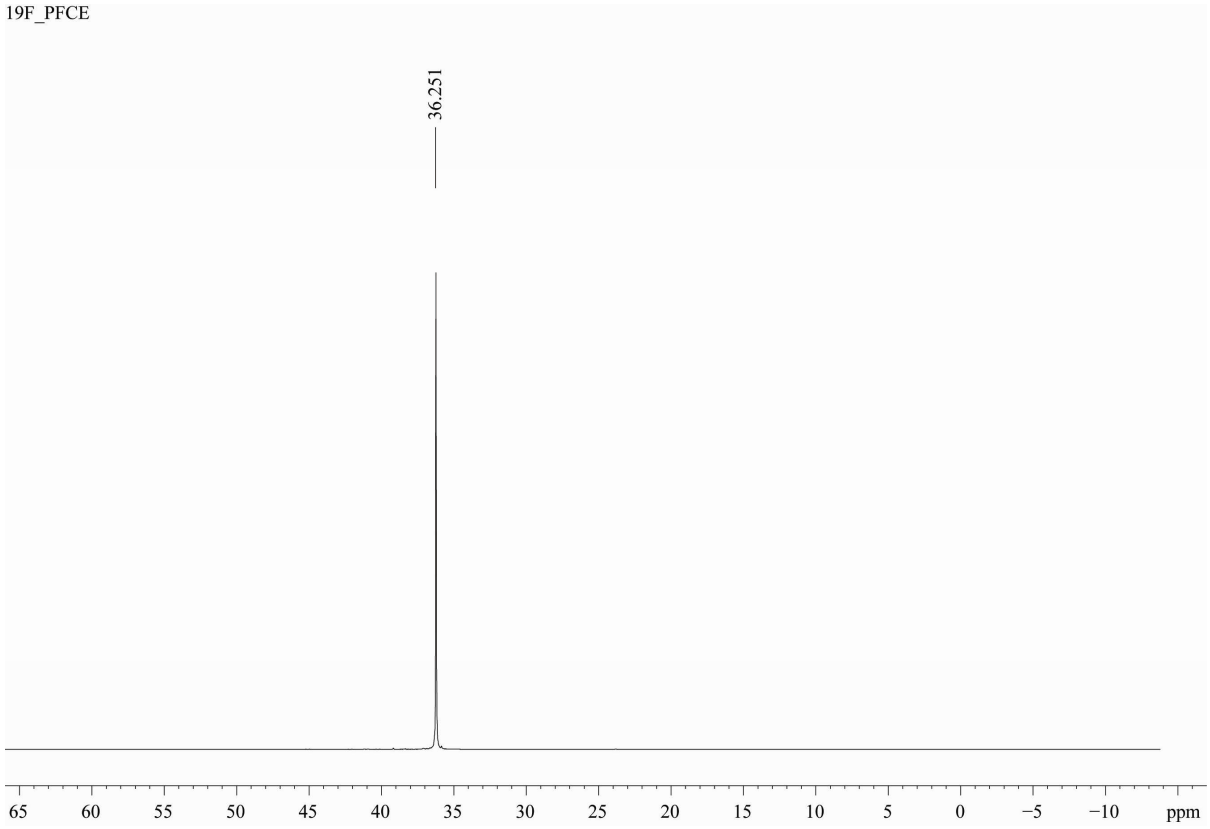


Figure S3. ^{19}F -based MR spectrum of PFCE.

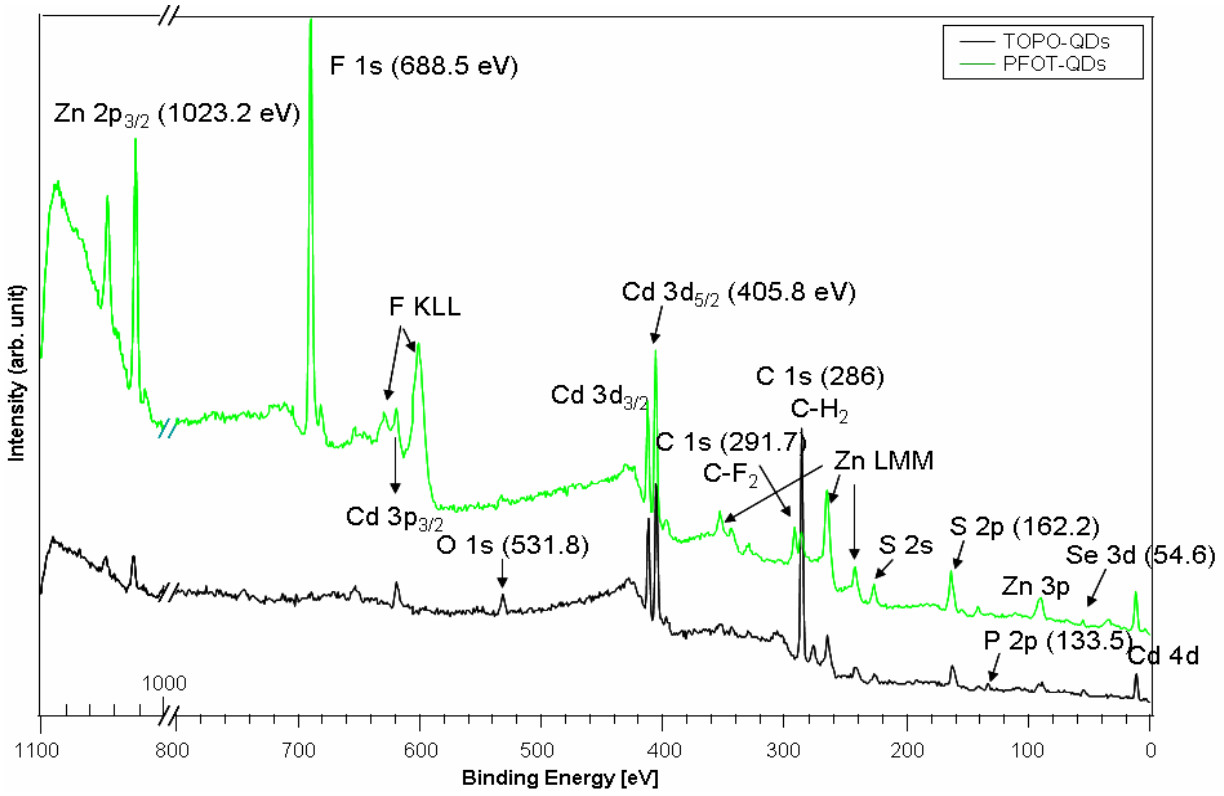


Figure S4. XPS Analysis of QDs before (TOPO) and after ligand exchange (PFOT)

PFC	Average Size (nm)	Zeta-Potential (mV)
PFOB	280	-33.27
PFD	283	-35.54
PFDOC	286	-29.67
PFCE	264	-20.03

Table S1. Size and zeta potential analysis of perfluorocarbons/[CdSe/ZnS QDs] nanocomposite emulsions.

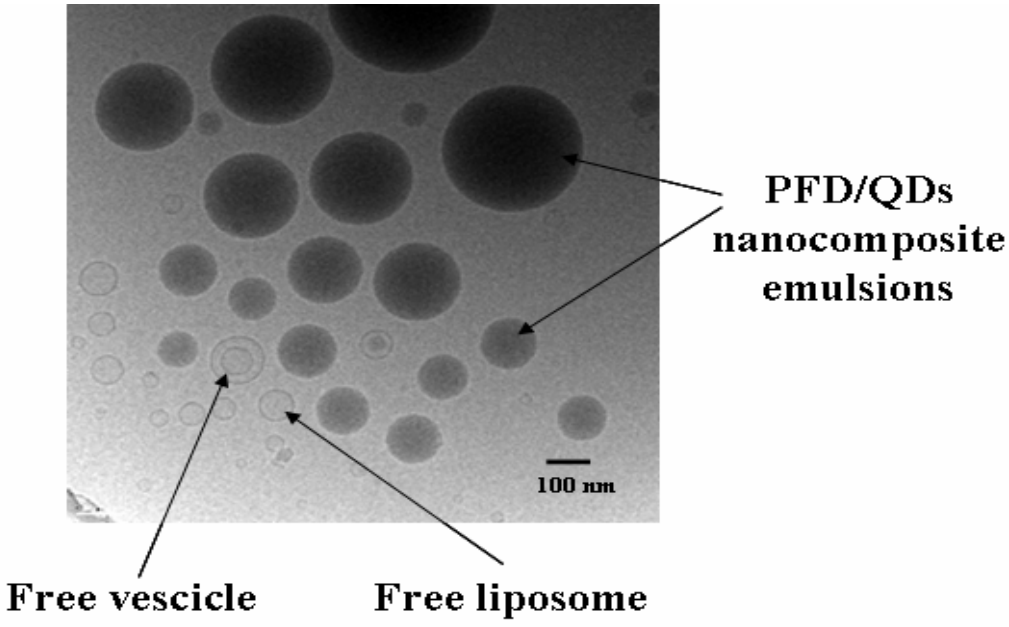


Figure S5. Cyro-TEM images of emulsified PFD/QDs nanocomposite emulsions

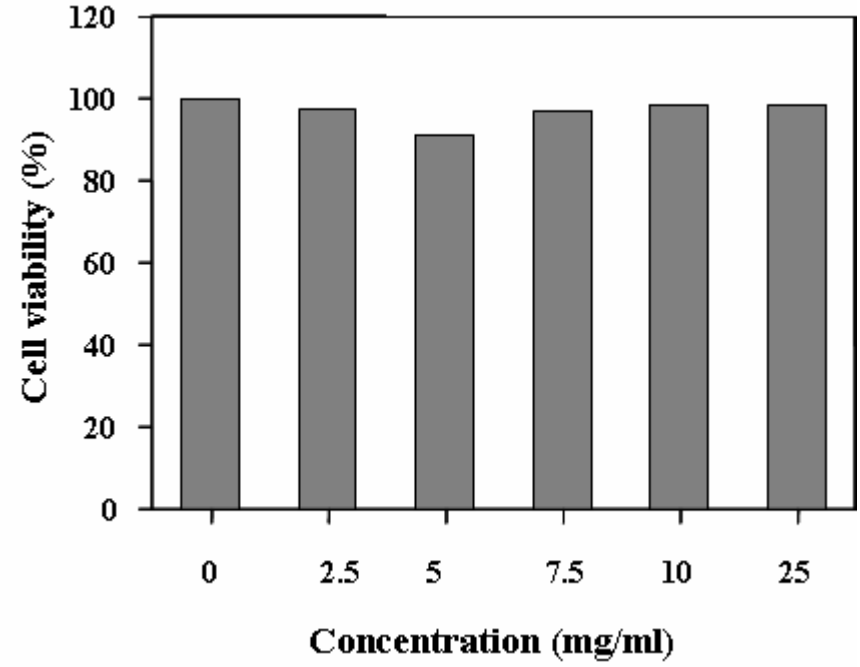
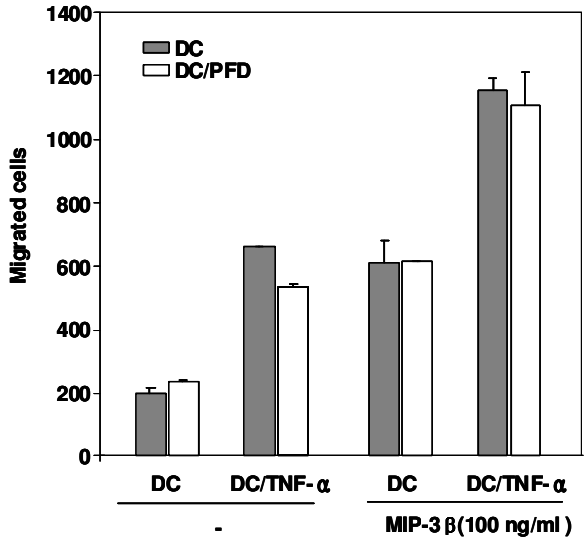


Figure S6. Viability of PFOB labeled DC2.4 cell

a)



b)

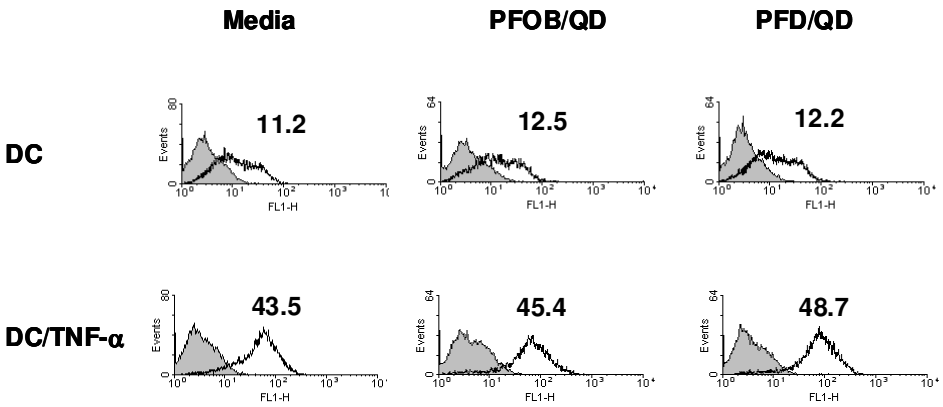


Figure S7. (a) Effect of PFC/QD nanoparticles on the migration of dendritic cells. The migration assay was performed by measuring migration through 8 μm pore polycarbonate filters for 4h. The migrated cells were acquired with a FACSCalibur device for 60 s up to the concentration of 25 mg/ml, (b) Effect of PFC/QD nanoparticles on the expression of dendritic cells (DC) maturation markers. Both control DC and DC treated with PFC/QD (10% v/v) were stimulated with TNF-α (50 μg/ml) for 24 h. Cells were stained with CD86 antibodies and subsequently analyzed for surface expression by flow cytometry (white histograms). The gray histograms represent non-staining cells; value in the top middle part of each panel represents the MFI in the presence of specific antibodies up to the concentration of 25 mg/ml

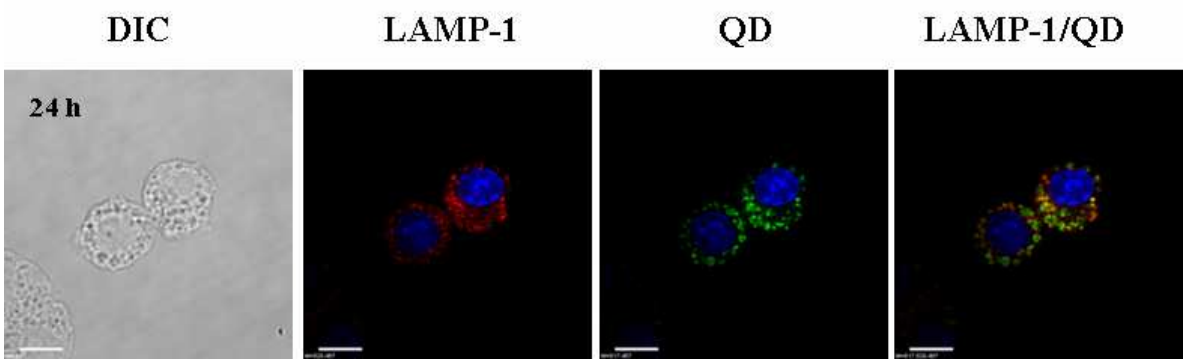


Figure S8. The localization of PFC/QDs nanocomposite emulsions within macrophage cells (RAW264.7). The RAW264.7 cells labeled with PFDOC/[CdSe/ZnS (525 nm) QDs] were stained with PE-conjugated LAMP-1 monoclonal antibody (red). Localization of lysosomes (red) and QDs (green, CdSe/ZnS (525 nm)) was determined by fluorescence microscopy. Scale bars represent 10 μm, DIC, differential interference contrast.

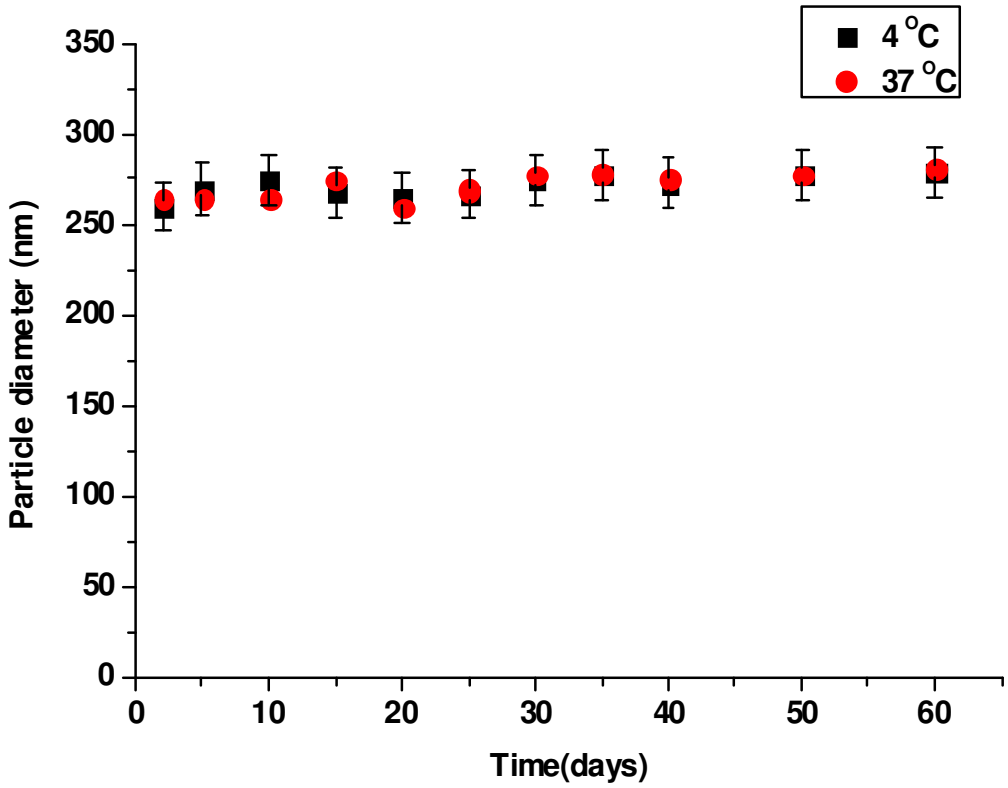


Figure S9. The stability of PFC/QDs nanocomposite emulsions

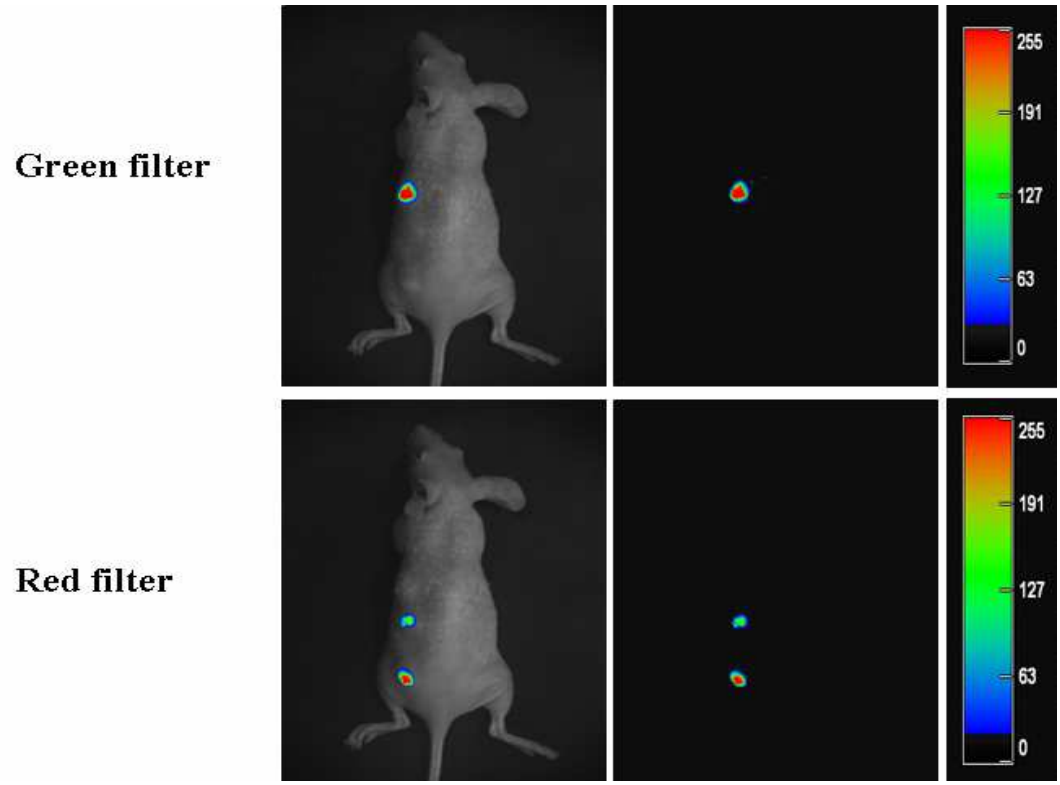


Figure S10. Signal intensity of *in vivo* fluorescence imaging

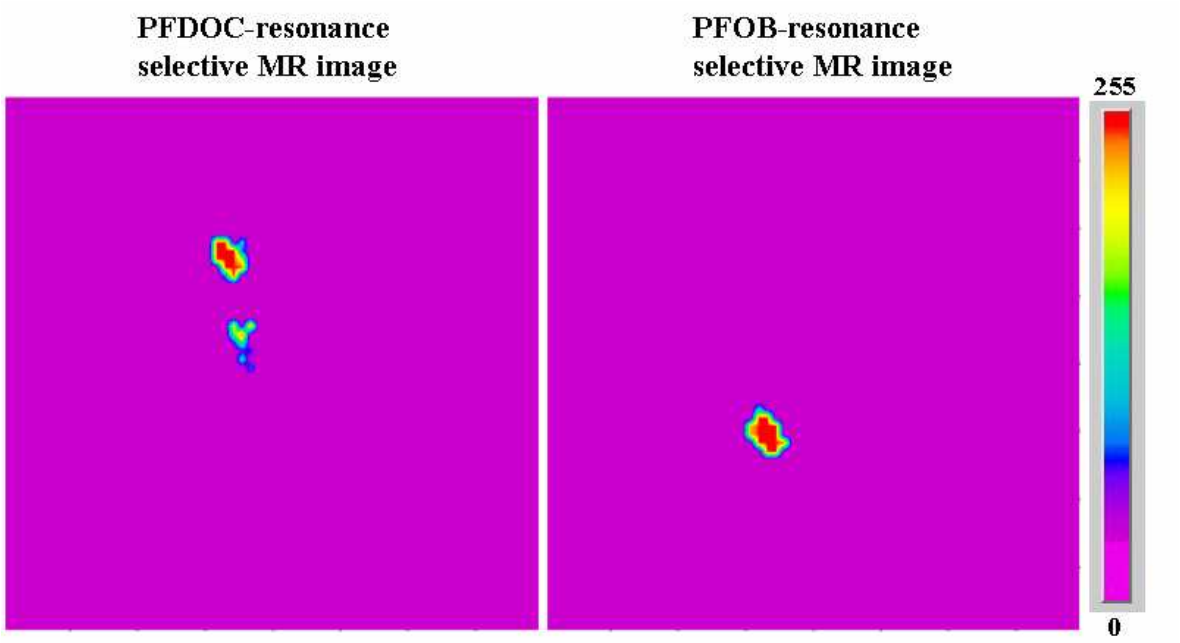


Figure S11. Signal intensity of *in vivo* ^{19}F-based MR imaging

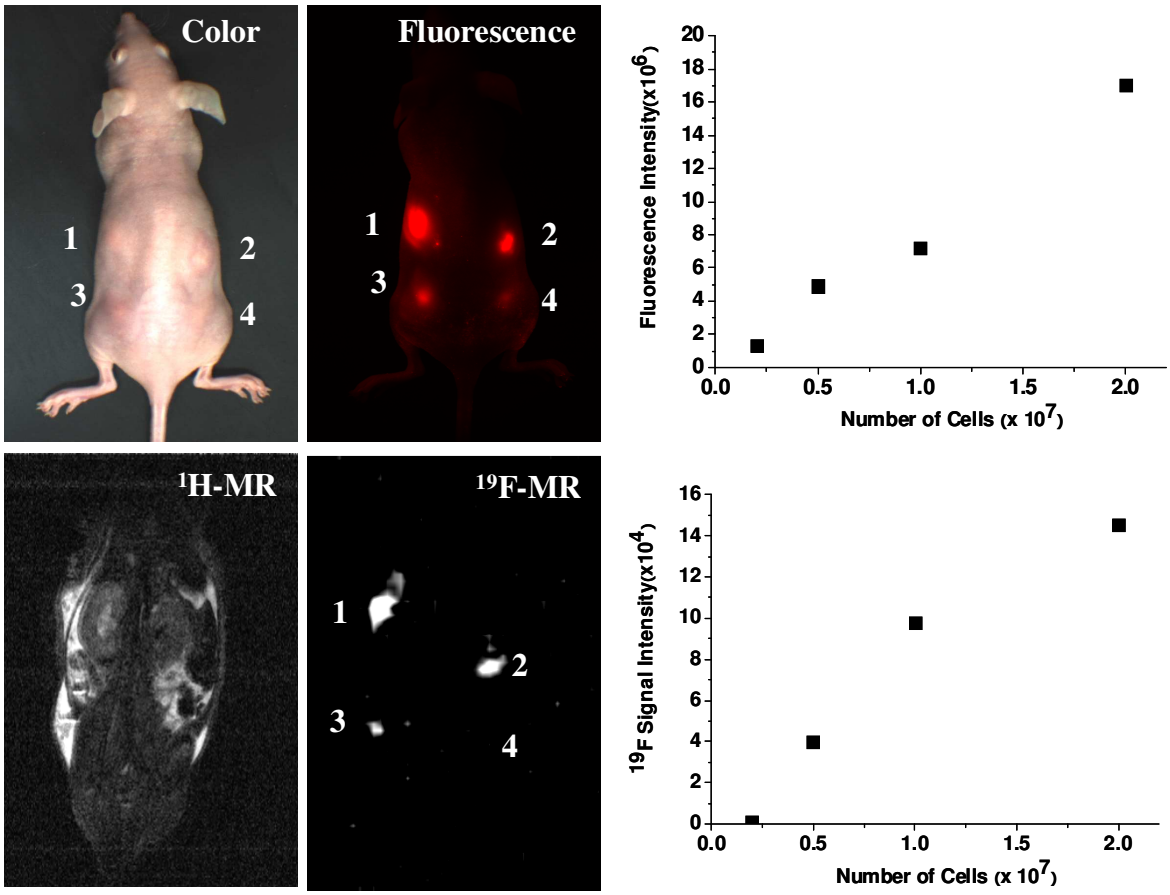


Figure S12. Detection sensitivity of serially diluted DCs labeled with PFOB/[CdSe/ZnS (596 nm) QDs)] nanocomposites after subcutaneous injection (The number of cells in each injection points ; 1: 2×10^7 , 2: 1×10^7 , 3: 5×10^6 , 4: 2×10^6). Based on signal intensity analysis, correlation between fluorescence and 19F-based MR signal intensity and the number of labeled dendritic cells was obtained.

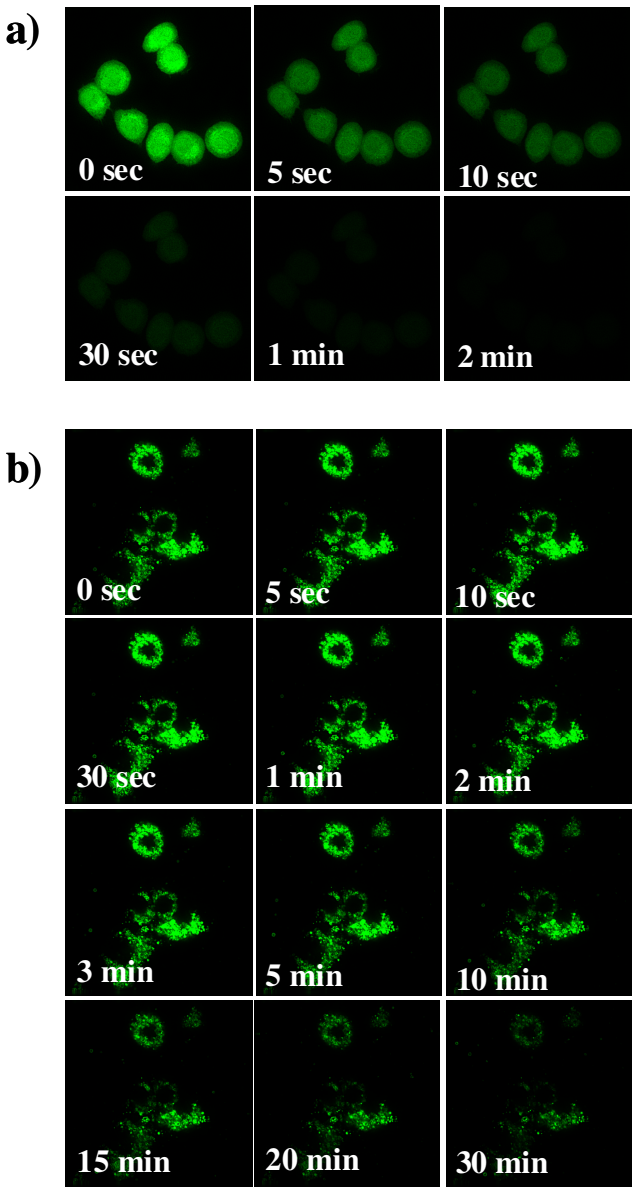


Figure S13. Comparison of photostability of PFC/QDs nanocomposite emulsions with that of conventional organic probes. Fluorescence photostability comparison of CFSE organic dye-stained (a) and PFOB/[CdSe/Zns (525 nm) QDs]-stained (b) dendritic cells with continuous excitation from a 488 nm. All images were obtained on a Deltavision RT system at the indicated times.

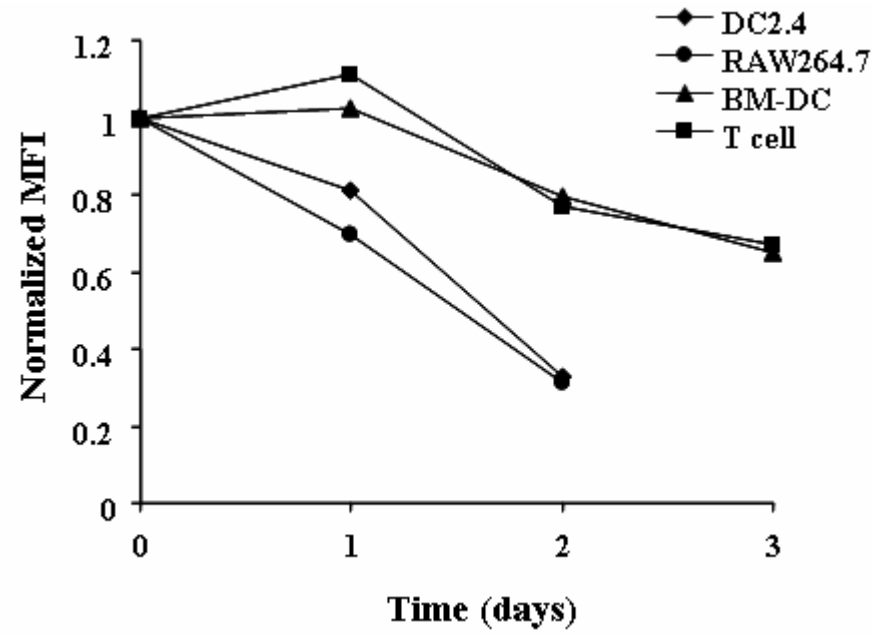


Figure S14. Intracellular retention of QD signals in various cells