Electronic Supplementary Material (ESI) for Nanoscale
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Electronic Supplementary Information (ESI)

Near-infrared (1550 nm) In Vivo Bioimaging Based on Rare-earth Doped Ceramic Nanophosphors Modified with PEG-*block*-poly(4-vinylbenzylphosphonate)

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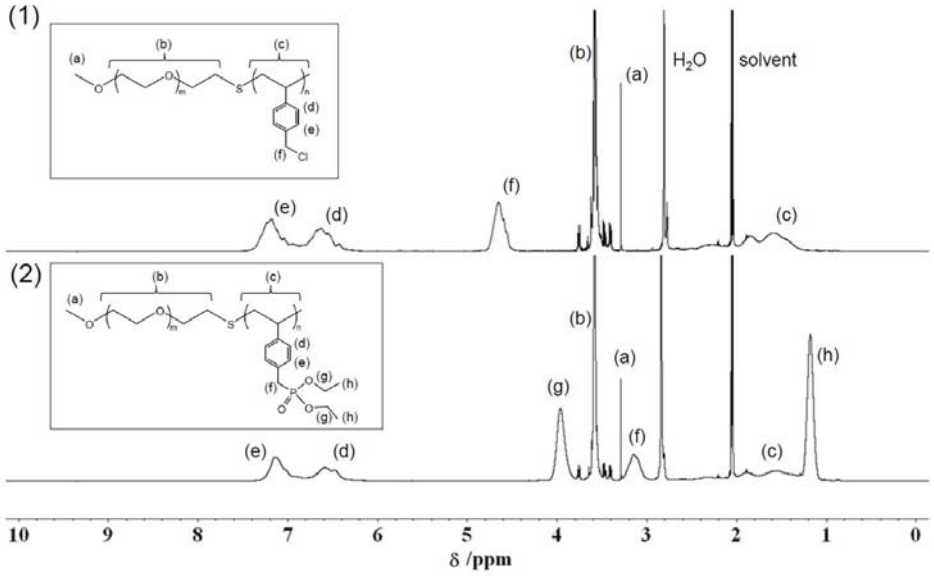

Fig. S1. ^{1}H-NMR spectra of (1) PEG-*b*-PCMS and (2) PEG-*b*-PDEVBP. (400 MHz, acetone-d_6, room temperature).

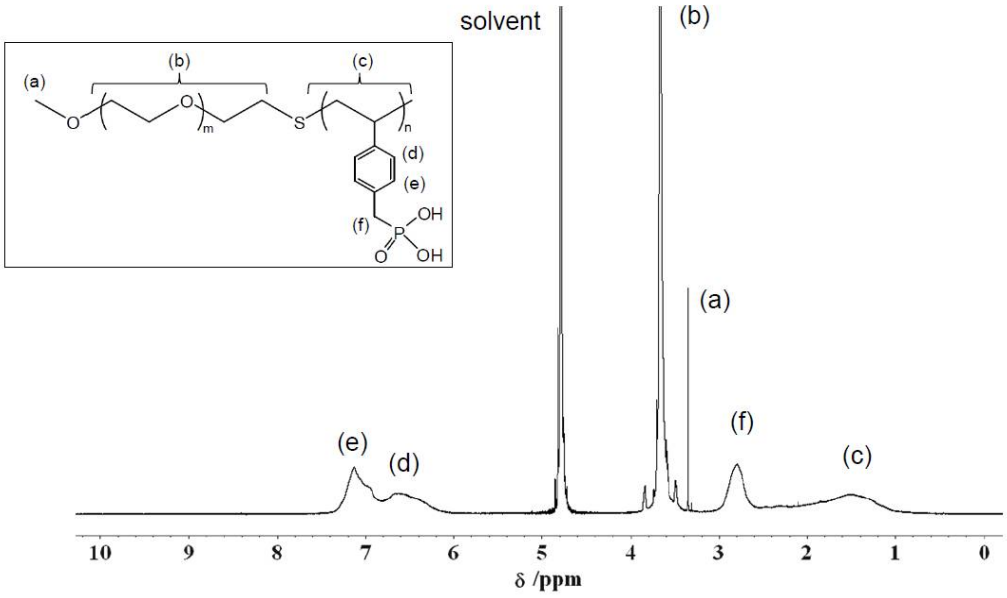

Fig. S2. ^{1}H-NMR spectrum of PEG-*b*-PVBP. (400 MHz, deuterium oxide/sodium deuteroxide (pD = 9.0), room temperature).

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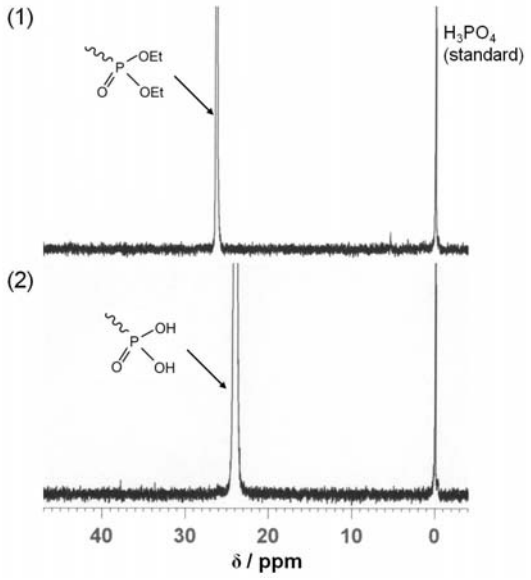
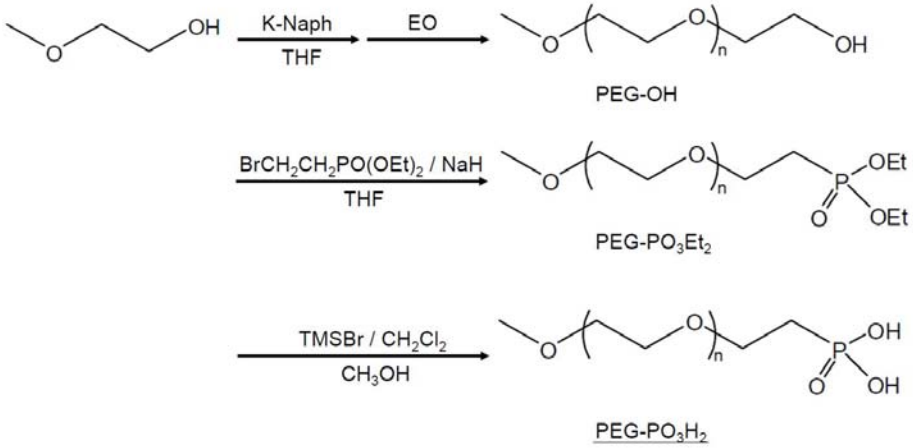


Fig. S3. ^{31}P-NMR spectra of (1) PEG-*b*-PDEVBP and (2) PEG-*b*-PVBP. (600 MHz, methanol-d_4, room temperature).



Scheme S1. Schematic representation of PEG-PO_3H_2 synthesis.

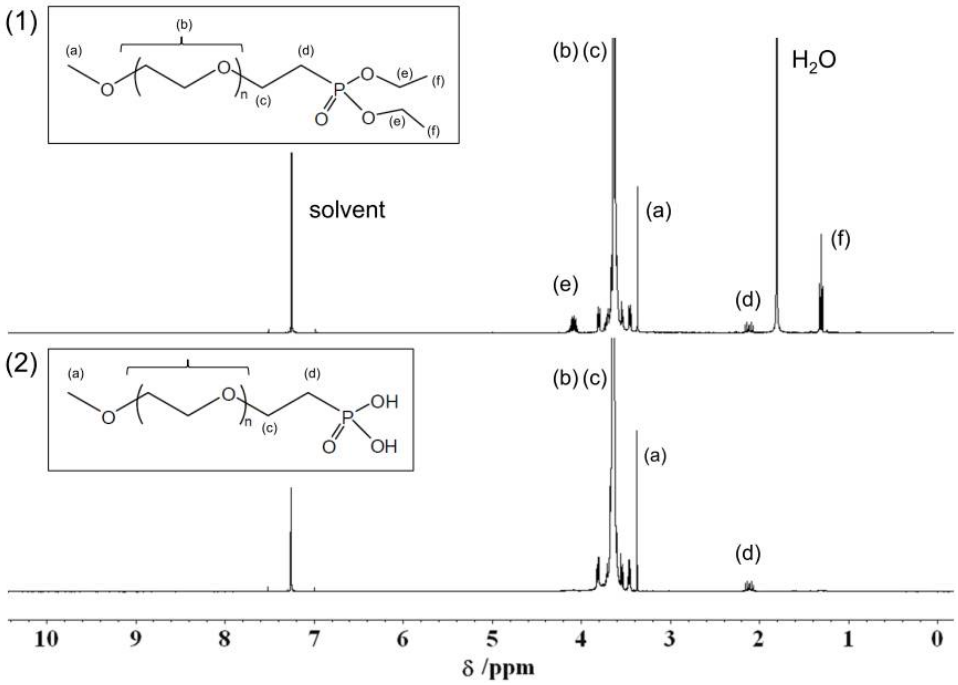


Fig. S4. ^{1}H-NMR spectra of (1) PEG-PO_3Et_2 and (2) PEG-PO_3H_2. (400 MHz, chloroform-d_1, room temperature).

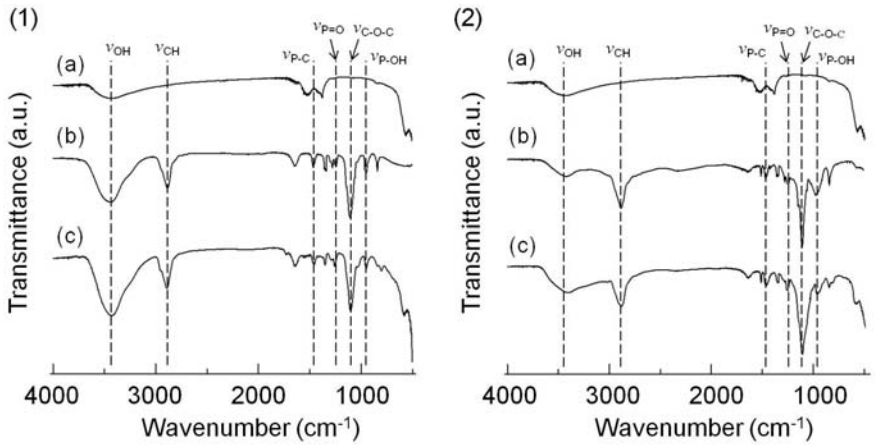


Fig. S5. (1) FT-IR spectra of YNPs absorbed with PEG-PO_3H_2. (a) native-YNPs, (b) PEG-PO_3H_2 polymer alone, and (c) PEG-YNP(1)s. (2) FT-IR spectra of YNPs absorbed with PEG-*b*-PVBP. (a) native-YNPs, (b) PEG-*b*-PVBP polymer alone, and (c) PEG-YNP(*b*)s.

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Table S1. PEG brush density on the YNP surface

Sample	Weight loss at 900 ºC (%)	PEG brush density (chains nm^{-2})*
PEG-YNP(1)	11.0	1.30
PEG-YNP(*b*)	2.1	0.14

Start temperature : 140 ºC, 30 min, rate of temperature increase : 10 ºC/min, end temperature : 900 ºC.
* PEG brush density was determined by the weight loss assuming all PEG is adsorbed on the YNP surface.

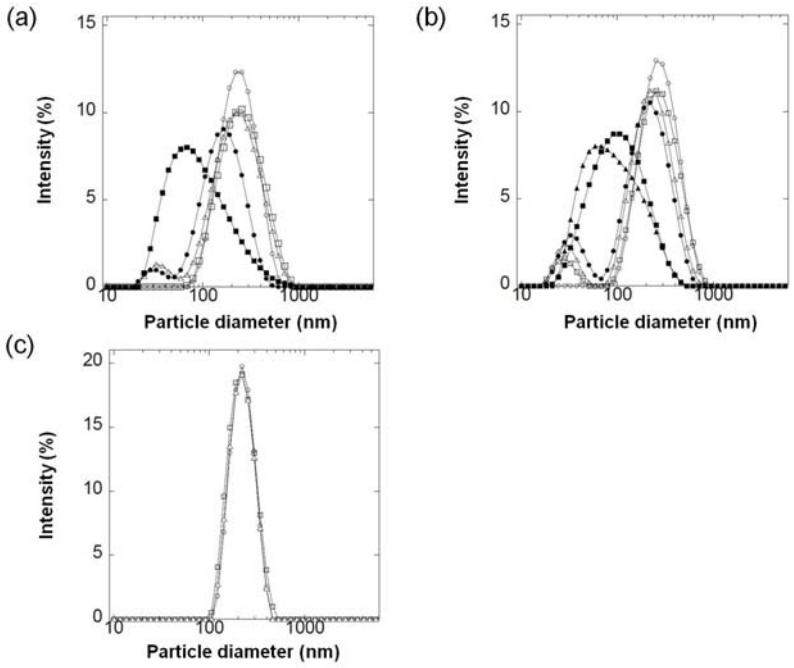

Fig. S6. Variation with time of the size distribution of YNP samples under acidic conditions. (a) native-YNPs. (Open circle) 0 min, (open square) 5 min, (open triangle) 10 min, (close circle) 15 min and (close square) 20 min. (b) PEG-YNP(1)s. (Open circle) 0 min, (open square) 10 min, (open triangle) 20 min, (close circle) 30 min, (close square) 40 min, and (close triangle) 60 min. (c) PEG-YNP(*b*)s. (Close diamond) 0 h, (open square) 24 h, and (close triangle) 48 h. (DLS measurement: room temperature, pH5.0).