Supplementary data:

Superparamagnetic Iron Oxide Nanoparticles Coated with a Folate-Conjugated Polymer

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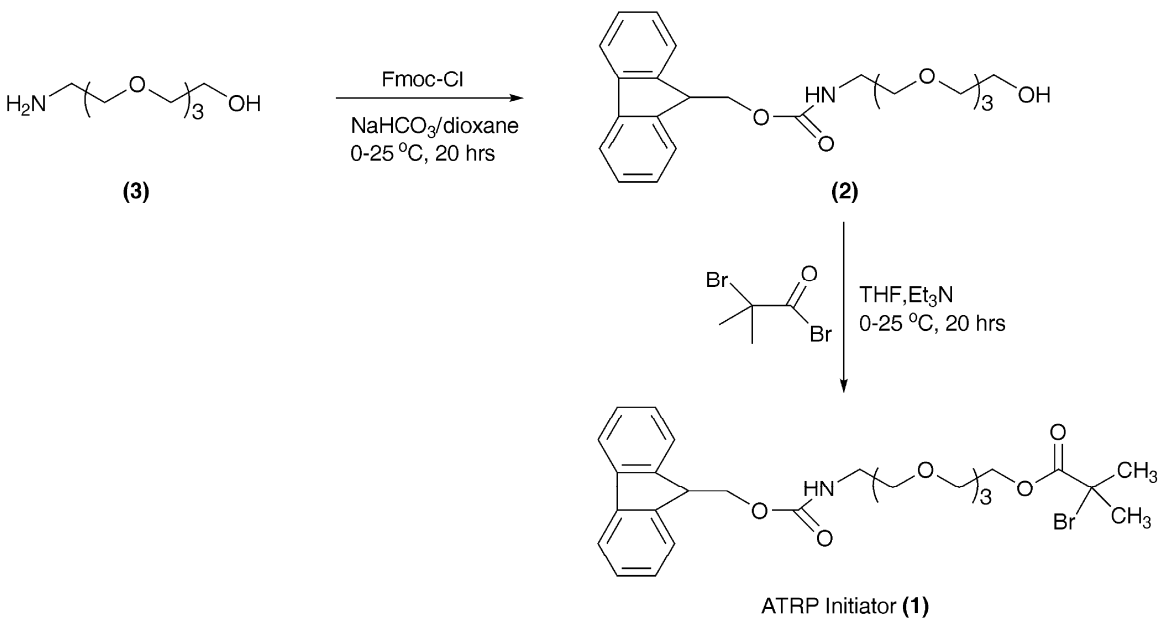
Experimental details for synthesis of ATRP initiator (1) (Scheme S1).

Compound **(3)** was synthesized according to the method previously described.[i] Compound **(3)** (5.60 g, 29.0 mmol) was dissolved in 45 mL of 5 wt% $NaHCO_3$ aqueous solution and the mixture cooled to 0 °C. A solution of Fmoc-Cl (5.00 g, 19.3 mmol) in dioxane (25 mL) was added, and the resulting mixture was stirred for 2 hrs at 0 °C, then 20 hrs at ambient temperature. After water was added (80 mL), the mixture was extracted with ethyl acetate (4 × 100 mL). The combined extracts were dried with magnesium sulfate and evaporated under reduced pressure to leave a yellow oil, which was purified by column chromatography on silica using ethyl acetate/petroleum ether (EtOAc/PE 3:1) as the eluent to give the compound **(2)** (7.20 g, 90%). R_f 0.24 (EtOAc). δ_H(400 MHz, $CDCl_3$) 7.77 (2 H, d, fluor), 7.64 (2 H, d, fluor), 7.41-7.29 (4 H, dt, fluor), 4.42 (2 H, d, fluor-CH_2O), 4.22 (1 H, t, (C9)), 3.54-3.70 (14 H, m, CH_2OCH_2, $HOCH_2$), 3.40 (2 H, t, CH_2NH). MS (HRMS) m/z 438.2 $(M+Na)^+$ (calculated), m/z 438.4 (found).

Compound **(2)** (7.20 g, 17.3 mmol) was dissolved in anhydrous THF (60 mL) followed by the addition of excess triethylamine (3.3 mL). The resulting solution was cooled in an ice bath, and 2-bromoisobutyryl bromide (2.9 mL, 23.5 mmol) was added to the stirred solution using a dropping funnel. The reaction was quite rapid, and a white precipitate of triethylammonium hydrobromide was formed. After stirring the mixture for 20 hrs, the white precipitate was removed by filtration, and 100 mL of a 3 wt% $NaHCO_3$ aqueous solution was added to the purified solution. The product was extracted with ethyl acetate (4 × 100 mL), and the combined extracts were dried with magnesium sulfate and concentrated under vacuum. The oil residue was finally purified on a silica gel column that was eluted with EtOAc/PE (1:2) to give ATRP initiator **(1)** (8.93 g, 91%). R_f 0.29 (EtOAc/PE 1:1). δ_H(400 MHz, $CDCl_3$) 7.78 (2 H, d, fluor), 7.62 (2 H, d, fluor), 7.42-7.30 (4 H, dt, fluor), 4.42 (2 H, d, fluor-CH_2O), 4.32 (2 H, t, CH_2OCO), 4.22 (1 H, t, (C9)), 3.54-3.70 (12 H, m, CH_2OCH_2), 3.41 (2 H, t, CH_2NH), 1.93 (6 H, s, $C(CH_3)_2$). MS (HRMS) m/z 586.15 $(M+Na)^+$ (calculated), m/z 586.3 (found).



Scheme S1 Synthesis route of ATRP initiator **(1)**.

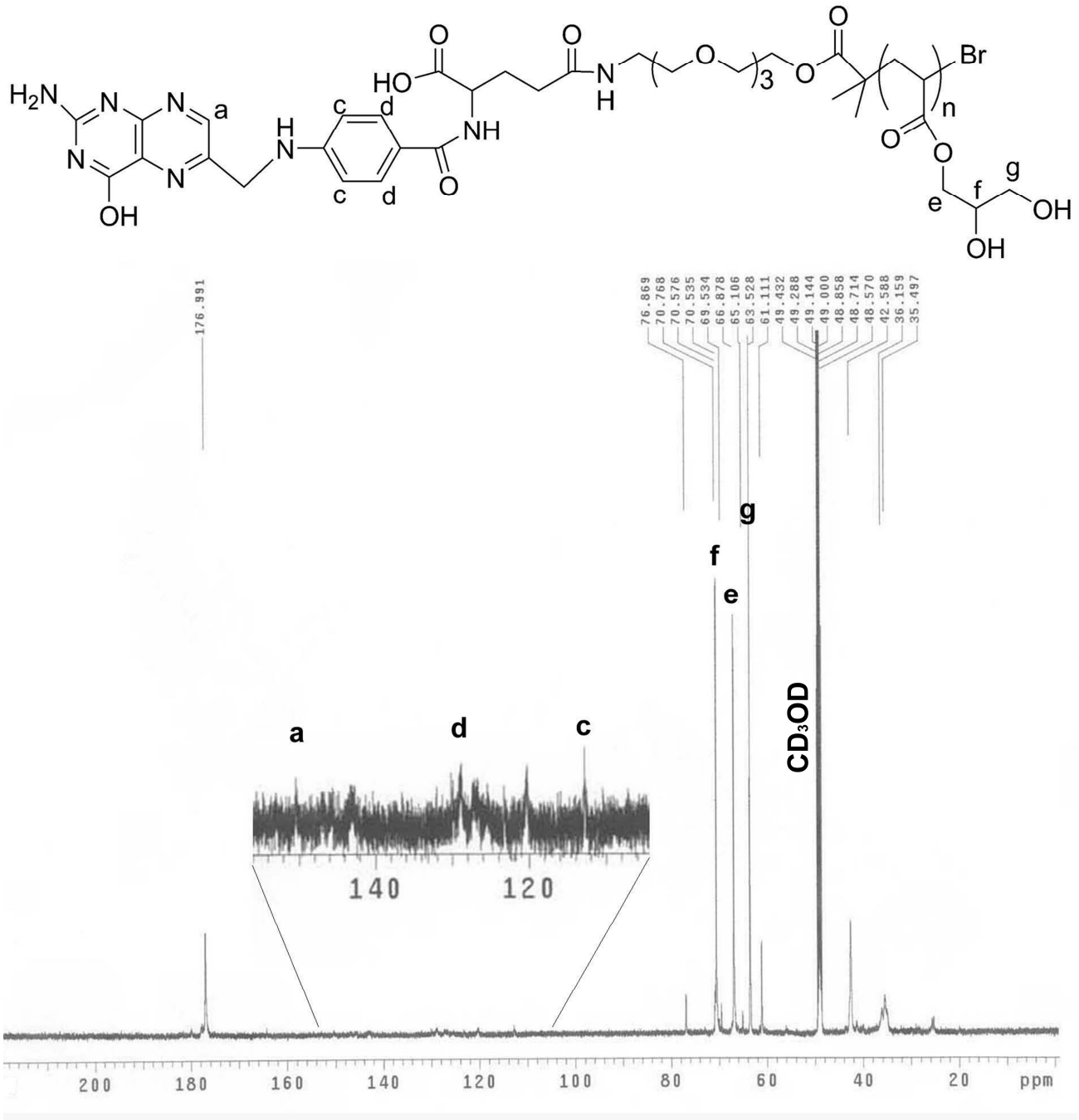


Fig. S1 ^{13}C NMR spectrum of FA-TEG-PGA.

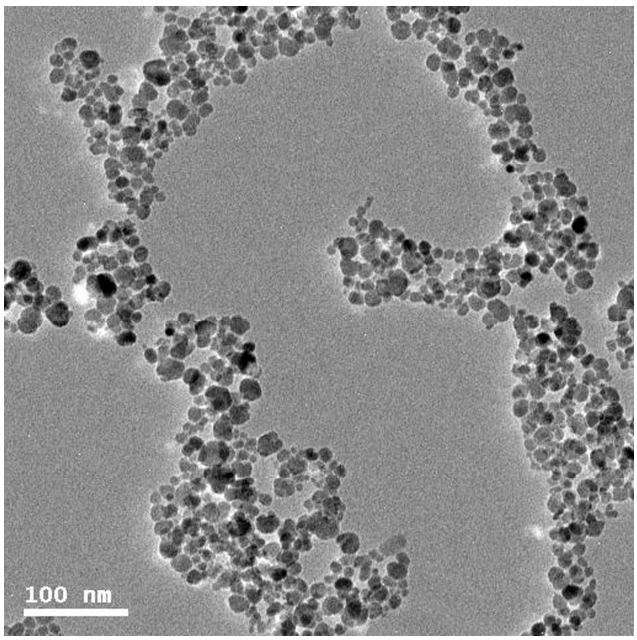


Fig. S2 TEM image of $HClO_4$-stabilized Fe_3O_4 nanoparticles.

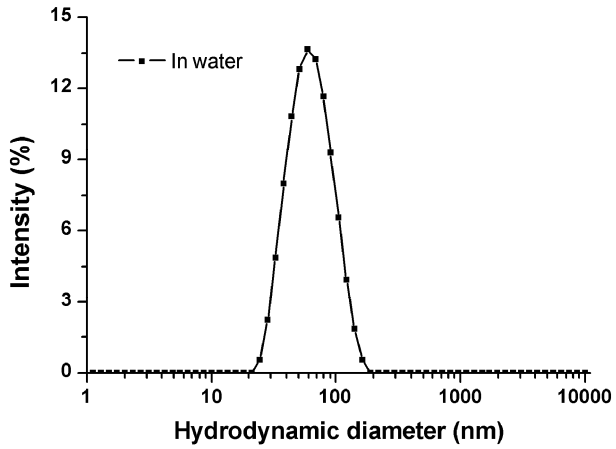


Fig. S3 DLS analysis of FA-TEG-PGA-coated Fe_3O_4 nanoparticles in water (1 mg mL^{-1}).

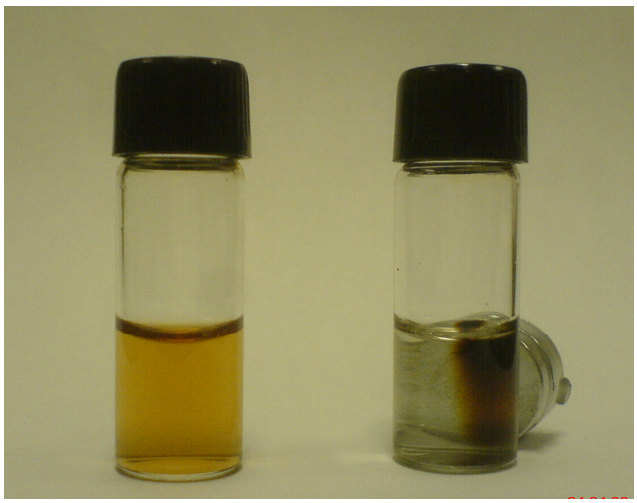


Fig. S4 Photograph indicating the attraction of FA-TEG-PGA-coated Fe_3O_4 nanoparticles dispersed in water by a magnet.

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i B. Frisch, C. Boeckler and F. Schuber, *Bioconjugate Chem.*, 1996, **7**, 180.