Supporting Information

An acrylate AIE-active dye with two-photon fluorescence switch for fluorescent nanoparticles by RAFT polymerization: synthesis, molecular structure and application in cell imaging

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Kinetics Experimental Section

The specific experimental process exploring the kinetics process of RAFT polymerization was shown as described below: TPMA (0.190 g, 0.360 mmol), PEGMA (0.720 g, 1.44 mmol), AIBN (3.40 mg, 0.0208 mmol), CTA (8.00 mg, 0.0304 mmol), trimethylbenzene (0.200 g) and toluene (5.00 mL) were put into a sealed Schlenk tube with a magnetic stir bar. The Schlenk tube was placed in liquid nitrogen, followed by deoxygenation for five times through a vacuum-nitrogen cycle. The Schlenk tube was continuously reacted for 36 h in an oil bath at 70°C with magnetic stirring. As the reaction gone on, samples were taken at different reaction times (0, 0.5, 1, 2, 4, 7, 14, 24, 36 h) for ^{1}H NMR analysis.

Fluorescence emission properties of TPMA

The fluorescence intensity of TPMA significantly increased with the red shift of emission wavelength as compared with previously reported TPB dye. As shown in Fig. S1, the emission wavelength of TPDA increased to 500 nm with a marked increase in fluorescence intensity, while the emission wavelength of TPB dye was 470 nm, and the fluorescence intensity was weak to be negligible under the same condition, which indicated that TPMA was more conducive to bioimaging.

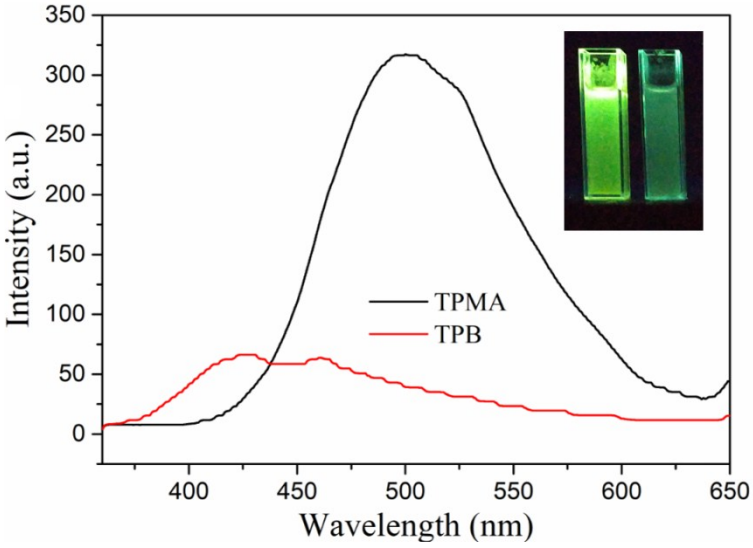

Fig. S1. Fluorescence emission difference of TPMA and TPB at same temperature and concentration (left bottle (TPMA), right bottle (TPB)).

Biocompatibility evaluations of PEG-TM

The effects of PEG-TM1 FONs on the morphology of L929 cells were investigated, which proved that PEG-TM1 FONs had good biocompatibility. The optical microscopy images in Fig. S2 showed the state of L929 cells which was cultured with different concentrations of PEG-TM1 FONs for 24 h. As can be seen from the three figures, no matter whether the cells were cultured with lower concentration of PEG-TM1 FONs or higher concentration of PEG-TM1 FONs, the cell morphology did not change significantly and remained in a normal state even though the higher concentration was up to 80 μg mL^{-1}.

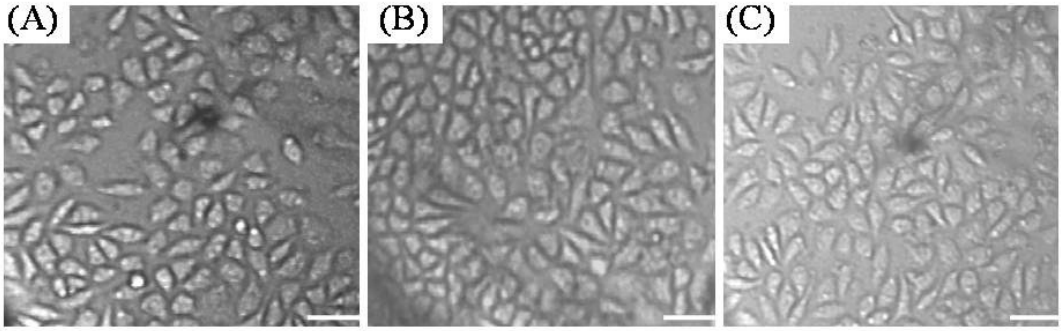

Fig. S2. Biocompatibility evaluations of PEG-TM1 FONs. A-C) Optical microscopy images of L929 cells cultured with different concentrations of PEG-TM1 FONs for 24 h: A) control cells. B) L929 cells cultured with 20 μg mL^{-1} PEG-TM1 FONs. C) L929 cells cultured with 80 μg mL^{-1}

PEG-TM1 FONs. (Scale bar =50 μm)