Supporting Information

The Synthesis of LA-Fe$_3$O$_4$@PDA-PEG-DOX for Photothermal-Chemotherapy Therapy

Yuhua Chen, Huiming Lin,* Feng Zhang, Qian Wang, Ruihan Tong, Na An, and Fengyu Qu*

Key Laboratory of Photochemical Biomaterials and Energy Storage Materials, Heilongjiang Province, College of Chemistry and Chemical Engineering, Harbin Normal University, Harbin, 150025, P. R. China
**Scheme S1.** Schematic illustration of the reaction process of mPEG-NH$_2$ with Fe$_3$O$_4$@PDAs.

**Scheme S2.** Schematic illustration of the different direction of the applied magnetic field.
**Figure S1.** The large angle XRD patterns of Fe$_3$O$_4$, Fe$_3$O$_4$@PDA3.

**Figure S2.** The digital photos of (a) Fe$_3$O$_4$, (b) Fe$_3$O$_4$@PDA3, (c) Fe$_3$O$_4$@PDA3-PEG solutions in PBS.
Figure S3. TEM images of PDA.

Figure S4. The fluorescence spectra of DOX and LA-Fe$_3$O$_4$@PDA-PEG-DOX under 480 nm excitation.

DOX reveals red fluorescence at 600-680 nm excited by 480 nm. However, the obvious fluorescence quenching of LA-Fe$_3$O$_4$@PDA-PEG-DOX is derived from the strong $\pi-\pi$ stacking of DOX and PDA.
**Figure S5.** TEM images of LA-Fe$_3$O$_4$@PDA3-PEG-DOX uptake by HepG2 cells.

TEM images show the remarkably endocytosed vesicles about 300-1000 nm suggesting that uptake of LA-Fe$_3$O$_4$@PDA3-PEG-DOX was mainly through endocytosis and macropinocytosis.
Figure S6. Flow cytometry analysis of the HepG2 cells incubated with FITC modified LA-Fe₃O₄@PDA3-PEG-DOX+NIR (808 nm 1 W cm⁻² 30 min) under different direction of magnetic field (a: without, b: top, c: side, d: bottom).