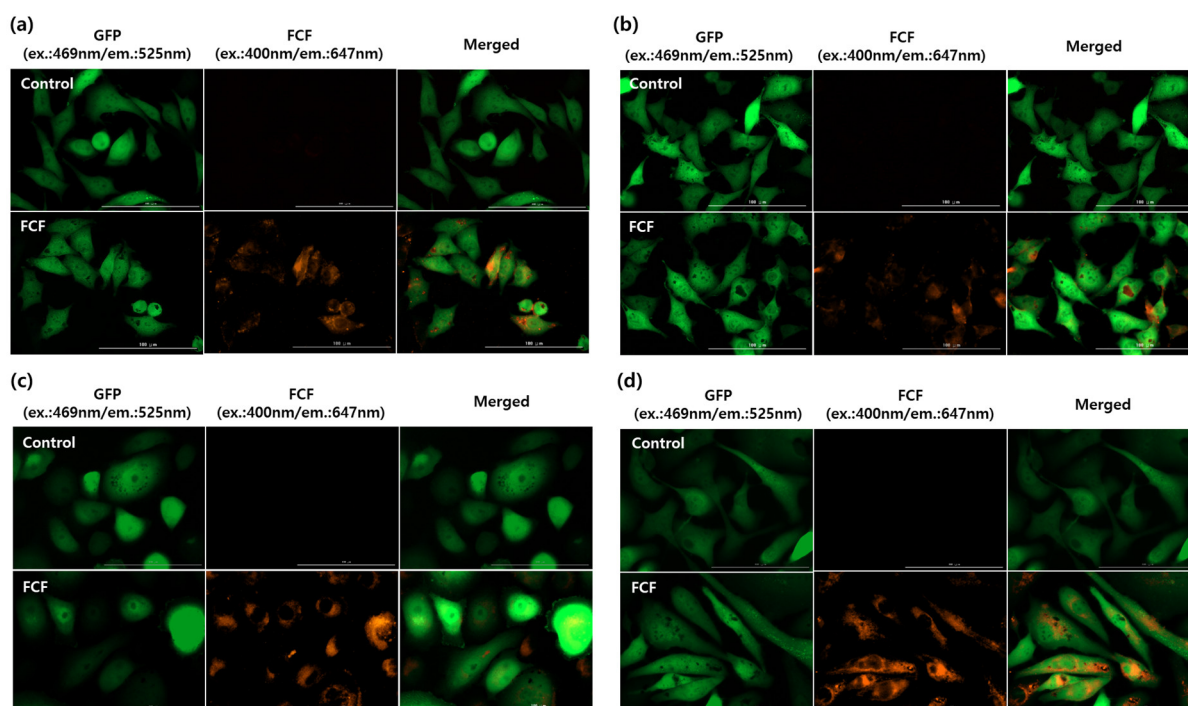


# Supplemental Materials: Photo-functionalized magnetic nanoparticles as a nanocarrier of anticancer agent for biomedical theragnostics

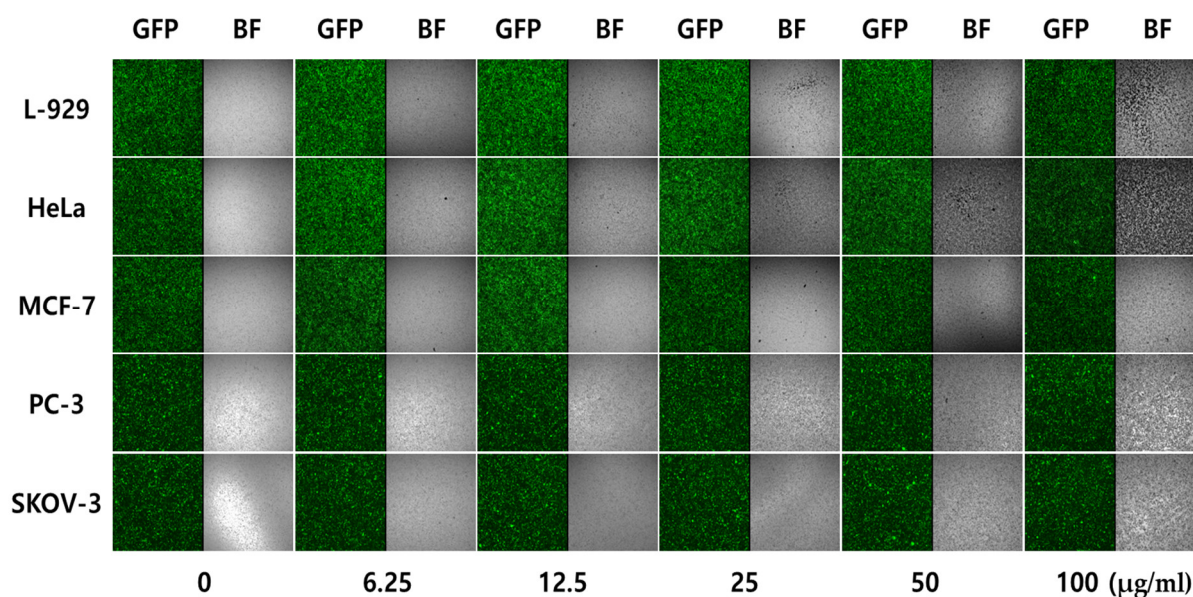
**Table 1.** FCF NP concentration-dependent T2 relaxation rate in each cancer cell.

| Concentration of FCF (ug/ml) | HeLa                    | MCF-7 | PC-3  | SKOV-4 |
|------------------------------|-------------------------|-------|-------|--------|
|                              | 1/T2 (s <sup>-1</sup> ) |       |       |        |
| 0                            | 2.83                    | 2.05  | 1.47  | 3.76   |
| 20                           | 5.77                    | 4.18  | 4.40  | 5.24   |
| 40                           | 7.78                    | 5.34  | 5.41  | 6.98   |
| 60                           | 8.74                    | 6.71  | 5.32  | 8.18   |
| 80                           | 11.45                   | 7.94  | 8.50  | 10.52  |
| 100                          | 15.31                   | 8.61  | 8.70  | 10.89  |
| 120                          | 15.06                   | 8.90  | 9.94  | 12.09  |
| 140                          | 19.16                   | 9.65  | 10.64 | 14.01  |
| 160                          | 19.88                   | 11.36 | 13.04 | 15.06  |
| 180                          | 20.92                   | 10.20 | 13.14 | 17.95  |
| 200                          | 21.93                   | 12.29 | 13.68 | 18.18  |
| 220                          | 28.99                   | 11.81 | 14.49 | 20.16  |

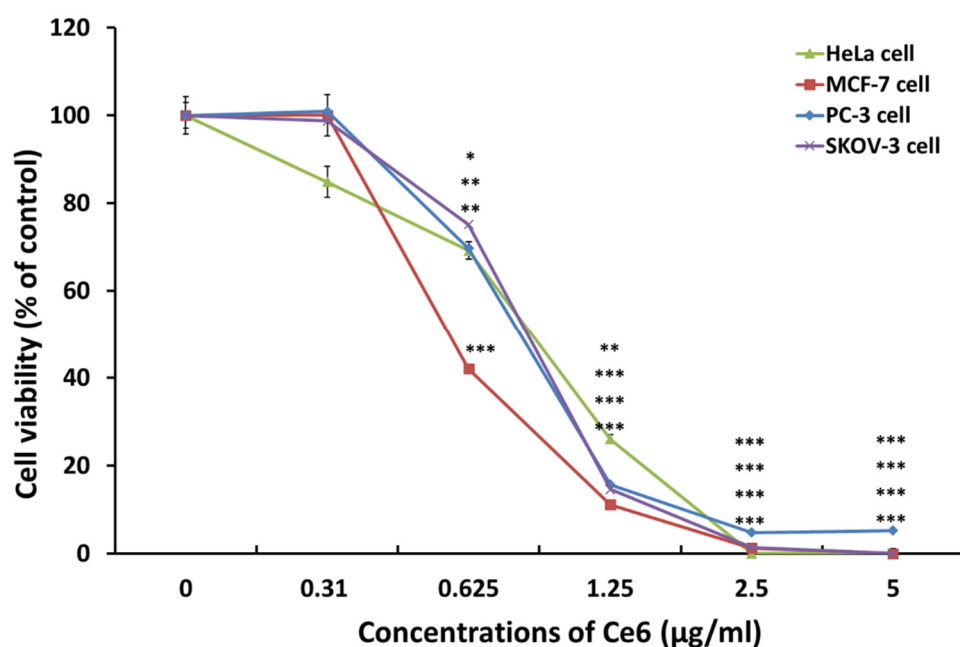


**Figure S1.** Fluorescence imaging of FCF NP-treated cancer cells. (a) HeLa, (b) MCF-7, (c) PC-3, and (d) SKOV-3 cells. Fluorescence images of green fluorescent protein (GFP)-transfected cancer cells taken after 2 h incubation with 20 µg/mL Fe<sub>3</sub>O<sub>4</sub>-Ce<sub>6</sub>-FA nanoparticles (FCF). The images were taken

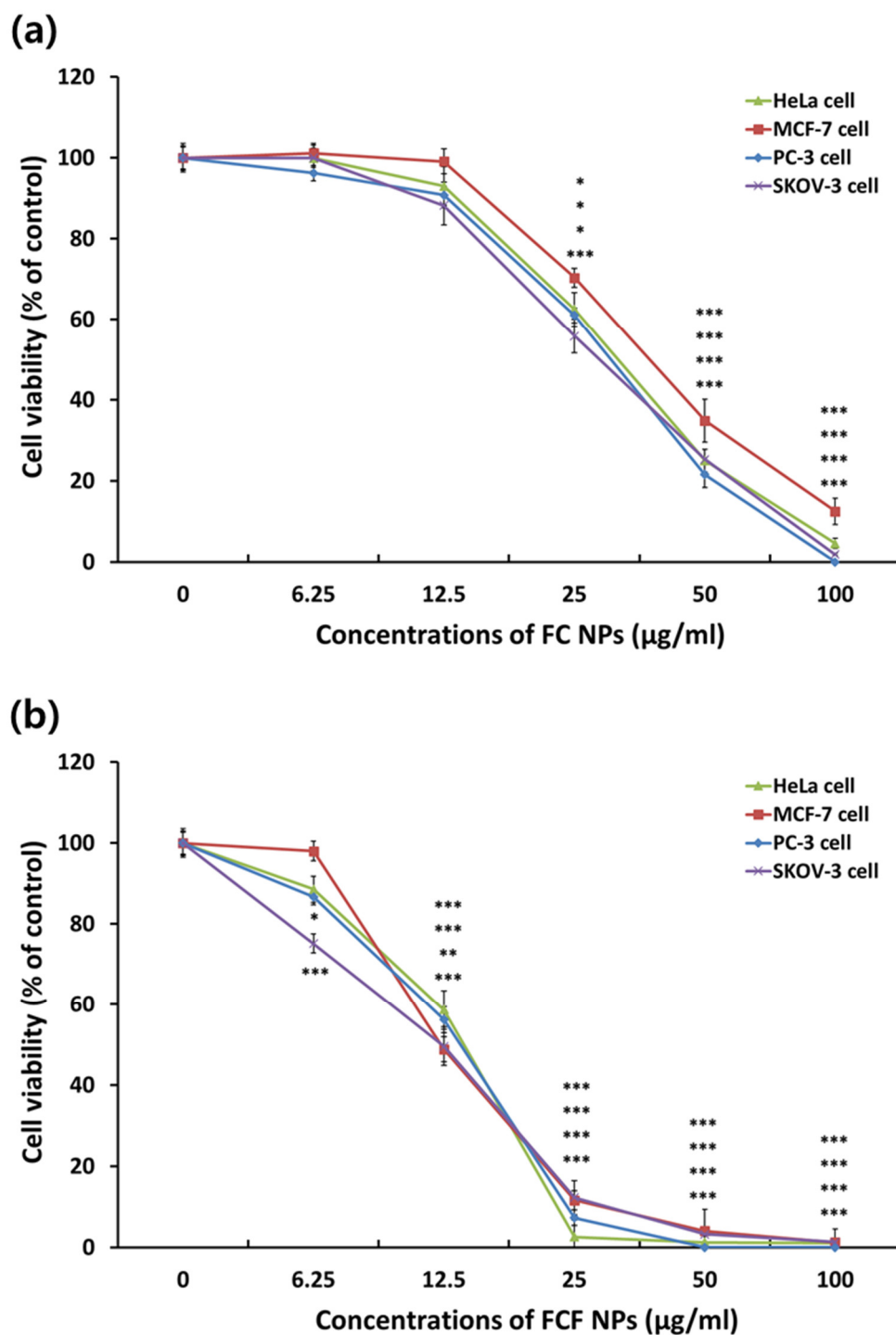
using a 40x objective lens and fluorescence optics (excitation/emission at 377/447 nm for GFP and 400/647 nm for FCF). Scale bar = 100  $\mu$ m.



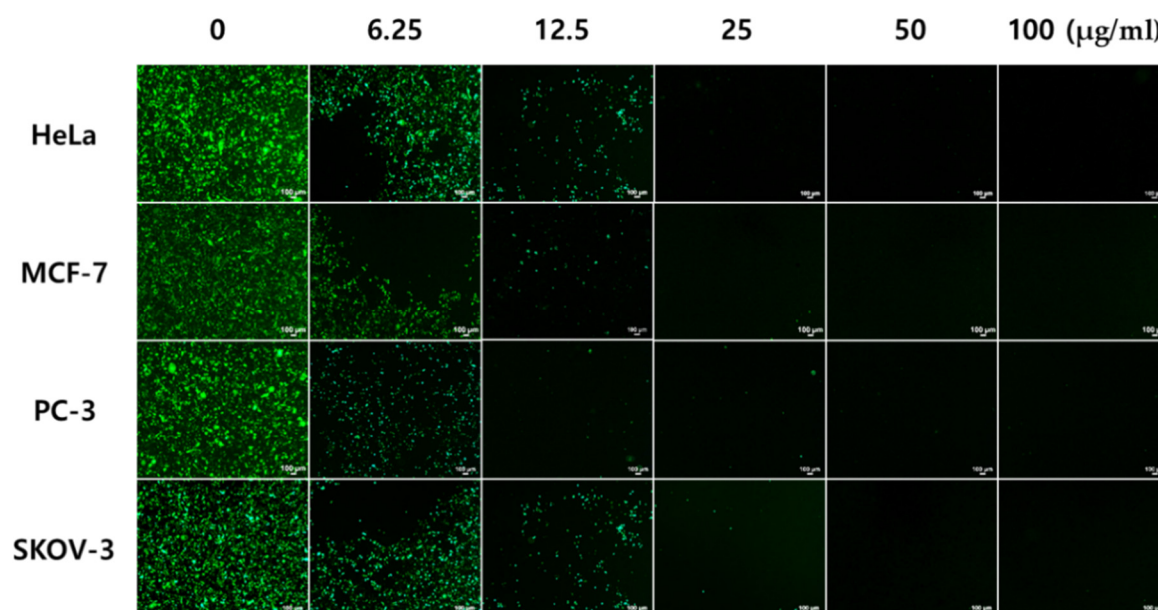
**Figure S2.** Fluorescence imaging for *in vitro* cytotoxicity of FCF NPs in various cell lines. Fluorescence cellular images were acquired using a 10x objective lens and fluorescence optics (excitation at 377 nm and emission at 447 nm) after incubation for 24 h under dark conditions. Scale bar = 100  $\mu$ m. GFP: Green fluorescent protein; BF: bright field.



**Figure S3.** Photodynamic anticancer activity of Ce6 in various cancer cells. Phototoxicity of Ce6 in HeLa, MCF-7, PC-3, and SKOV-3 cells over 10-min exposure to 40 mW LED light. Data for photodynamic anticancer activity are expressed as mean  $\pm$  S.D. (n = 4). Statistical significance was analyzed by Student's *t*-tests. \**p* < 0.05, \*\**p* < 0.005, \*\*\**p* < 0.0005 (vs. control).



**Figure S4.** Photodynamic FC and FCF NPs anticancer activity in various cancer cells. Phototoxicities of the (a) FC and (b) FCF NPs in HeLa, MCF-7, PC-3, and SKOV-3 cell over 10-min exposure to 40 mW LED light. Data for photodynamic anticancer activity are expressed as mean  $\pm$  S.D. ( $n = 4$ ). Statistical significance was analyzed by Student's  $t$ -tests.  $*p < 0.05$ ,  $**p < 0.005$ ,  $***p < 0.0005$  (vs. control).



**Figure S5.** Fluorescence images showing phototoxicity of the FCF NPs in cancer cells. Fluorescence images of live cancer cells were taken 24 h after PDT (40mW) for 10 min. The images were acquired using a 10x objective lens and fluorescence optics (excitation/emission at 377/447 nm). Scale bar = 100  $\mu\text{m}$ .