Supplementary Figure 1. A schematic representation of aptide structure and the sequences of the corresponding aptides.

Supplementary Figure 2. UV-Vis absorption spectra of filtrates that were obtained after the filtration of the indicated solutions using a centrifugal filter (MW cut-off, 50 kDa).

Supplementary Figure 3. Changes in the hydrodynamic size of APT_{EDB}-TCL-SPIONs incubated in distilled water or cell culture medium containing 10% FBS for 6 days.

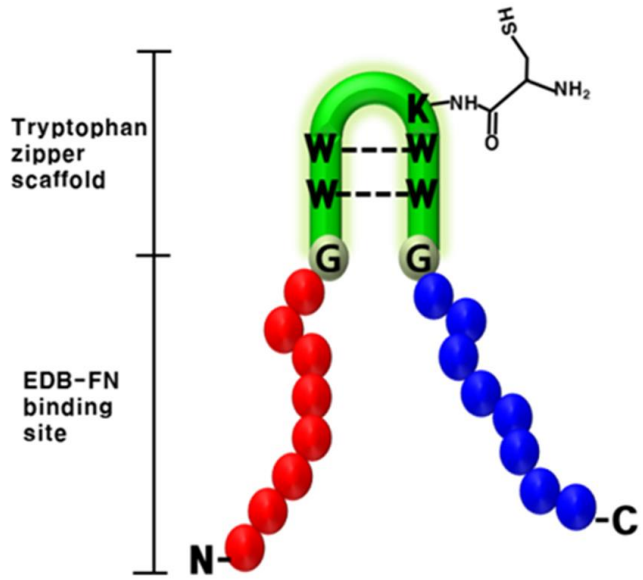
Supplementary Figure 4. *in vitro* MRI of cell phantoms at different cell numbers. (A) T_2-weighted image of phantoms consisting of 0 ~ 5 x 10^6 NDY-1 cells treated with APT_{EDB}-TCL-SPION for 12 h. (B) The plot of transverse relaxation rate (R_2) measured from NDY-1 cell phantoms.

Supplementary Figure 4. *In vitro* MRI of cell phantoms at different cell numbers. (A) T_2-weighted image of NDY-1 cell phantoms of different cell numbers. (B) Plot of transverse relaxation rates (R_2) measured from NDY-1 cell phantoms.

Supplementary Figure 5. MRIs of tumors obtained from mice injected with TCL-SPION. (A) Representative T_2*-weighted multi-slice images of the NDY-1 tumors obtained from mice prior to injection and at 4 h and 24 h after the intravenous injection of TCL-SPION (20 mg Fe/kg). (B) The changes in signal intensity on T_2*-weighted images of tumor, liver, spleen, and kidney.

Supplementary Figure 6. Biodistribution analysis of APT_{EDB}-TCL-SPION and $APT_{scramble}$-TCL-SPION. Representative Prussian blue staining of brain, heart, liver, spleen, kidney and thigh muscle isolated from non-tumor-bearing mice at 24 h post-injection with APT_{EDB}-TCL-SPION and $APT_{scramble}$-TCL-SPION. Accumulated iron was detected as a blue dot in microsections of the liver and spleen. Scale bar: 100 μm

Supplementary Figure 1

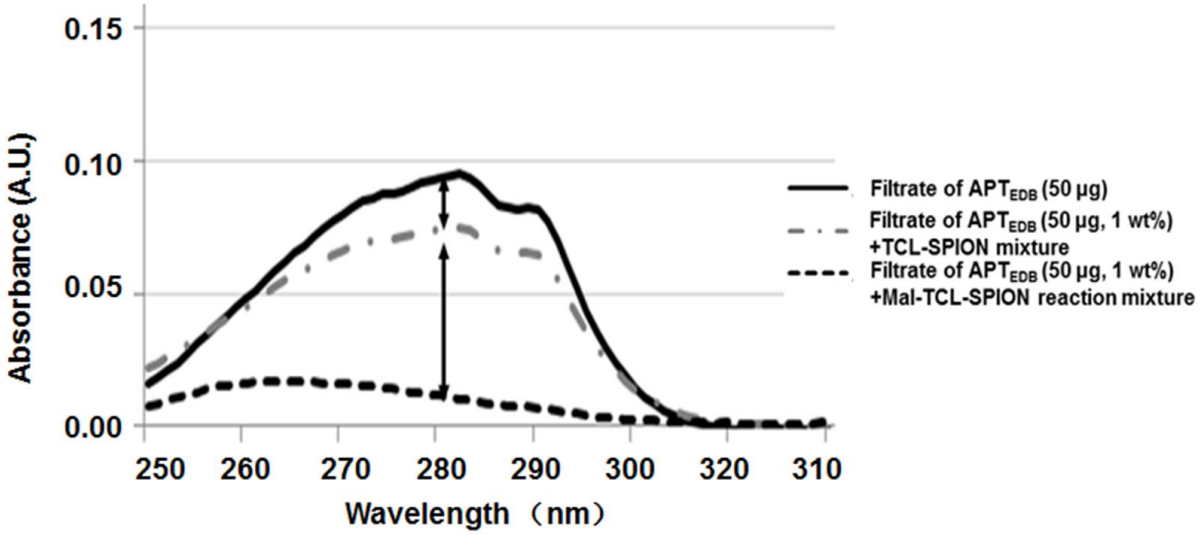


cys-APT$_{EDB}$: NH_2-HSSSSPIQ*GSWTWENGK(cys)WTWKG*IIRLEQQP-COOH

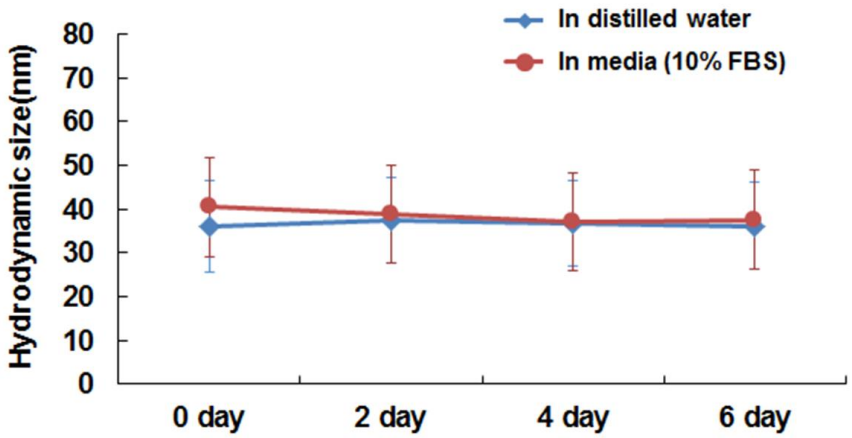
Cy3.3-APT$_{EDB}$: NH_2-HSSSSPIQ*GSWTWENGK(cys-Cy3.3)WTWKG*IIRLEQQP-COOH

cys-APT$_{scramble}$: NH_2-HASDRN*GSWTWENGK(cys)WTWKG*LHEQSD-COOH

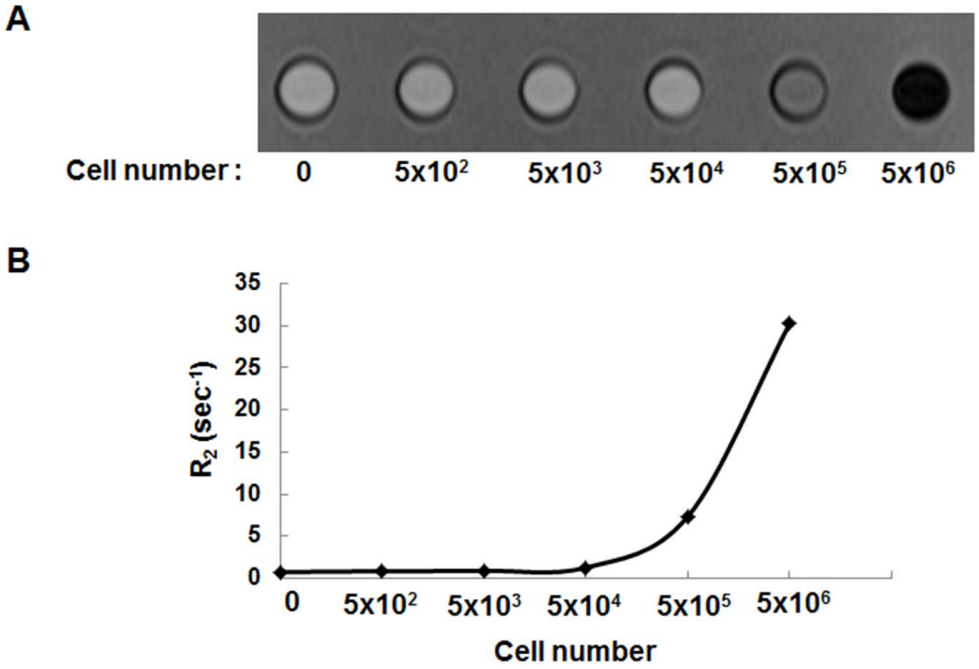
Supplementary Figure 2



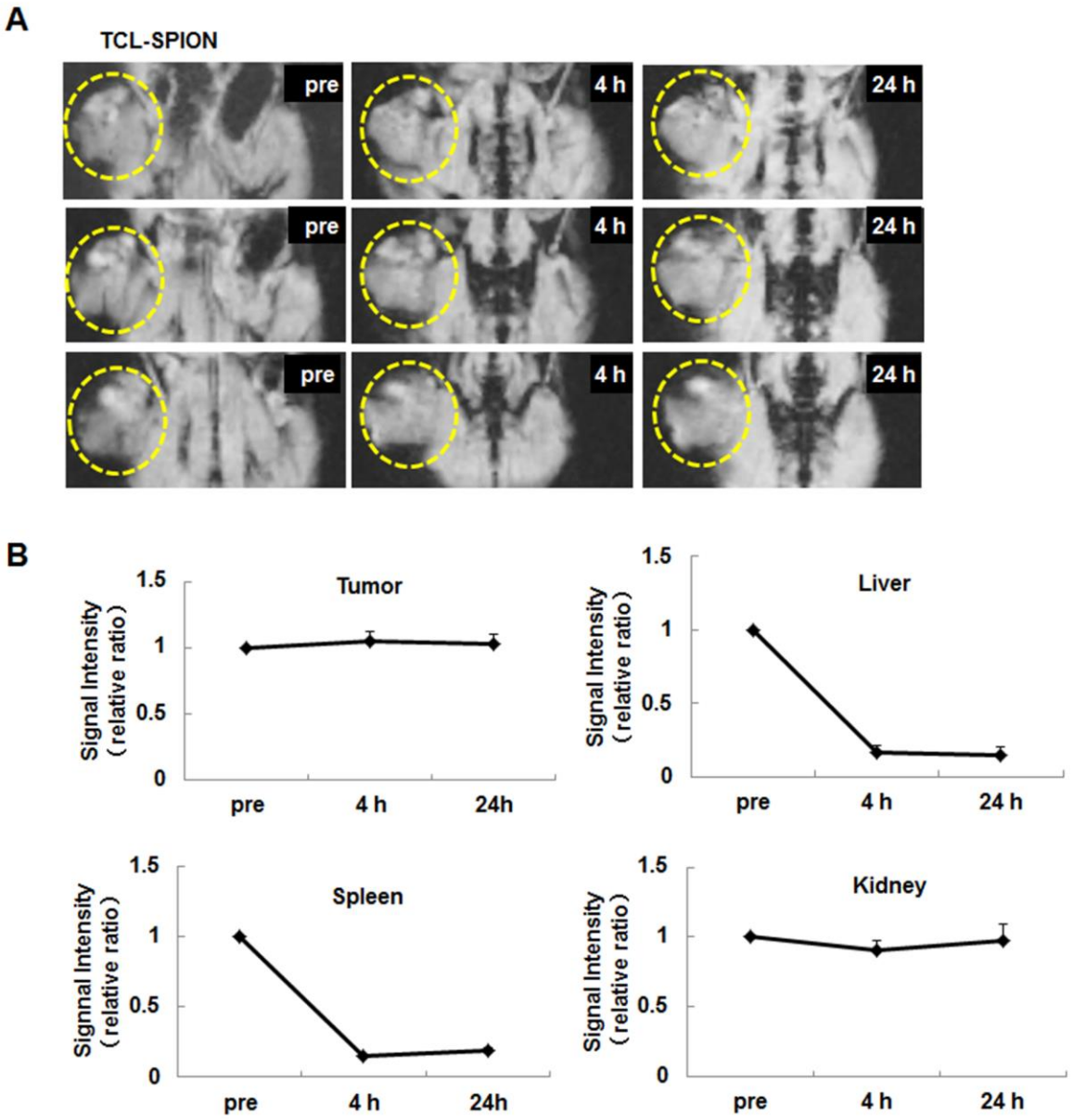
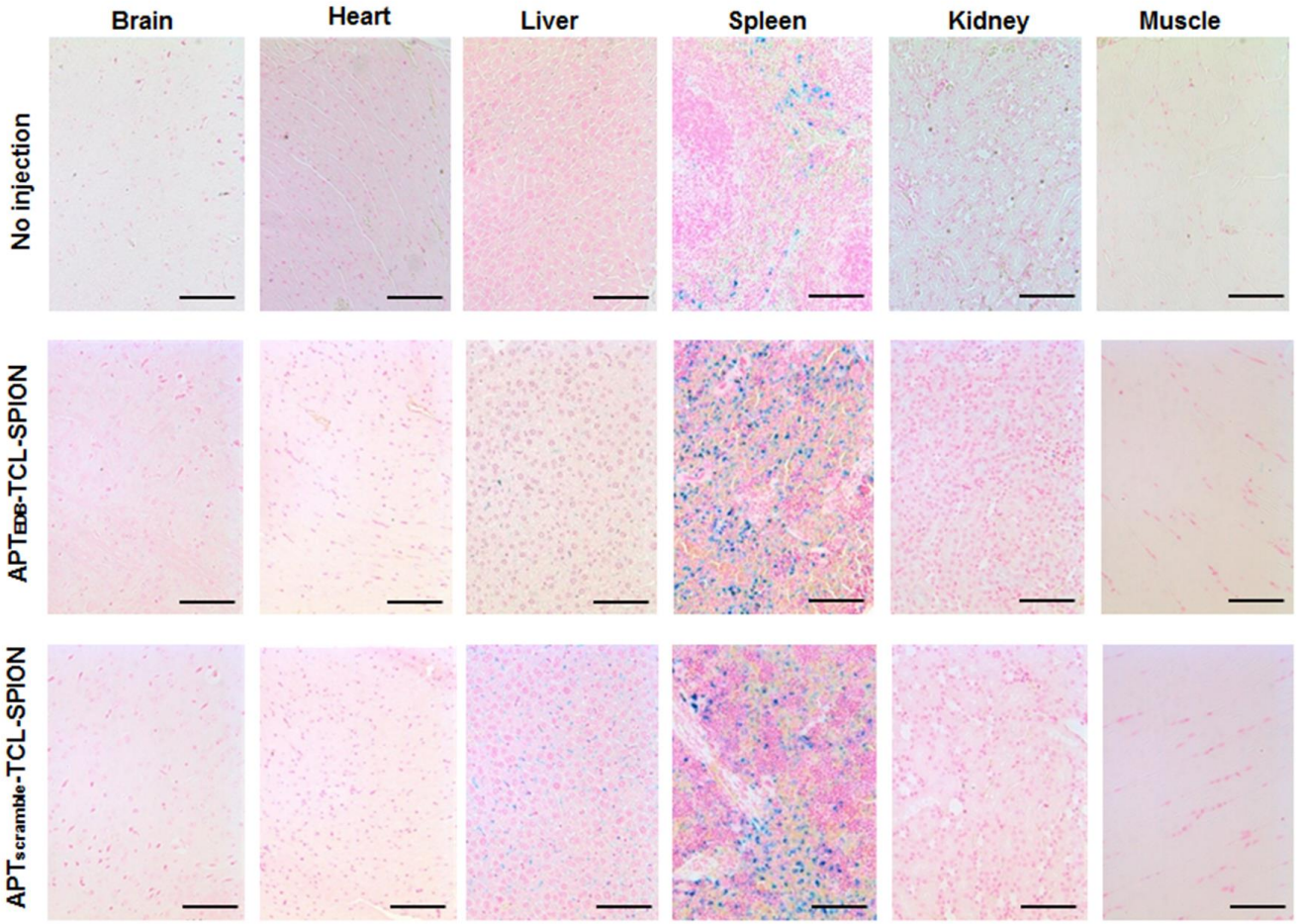
Supplementary Figure 3



Supplementary Figure 4



Supplementary Figure 5



Supplementary Figure 6