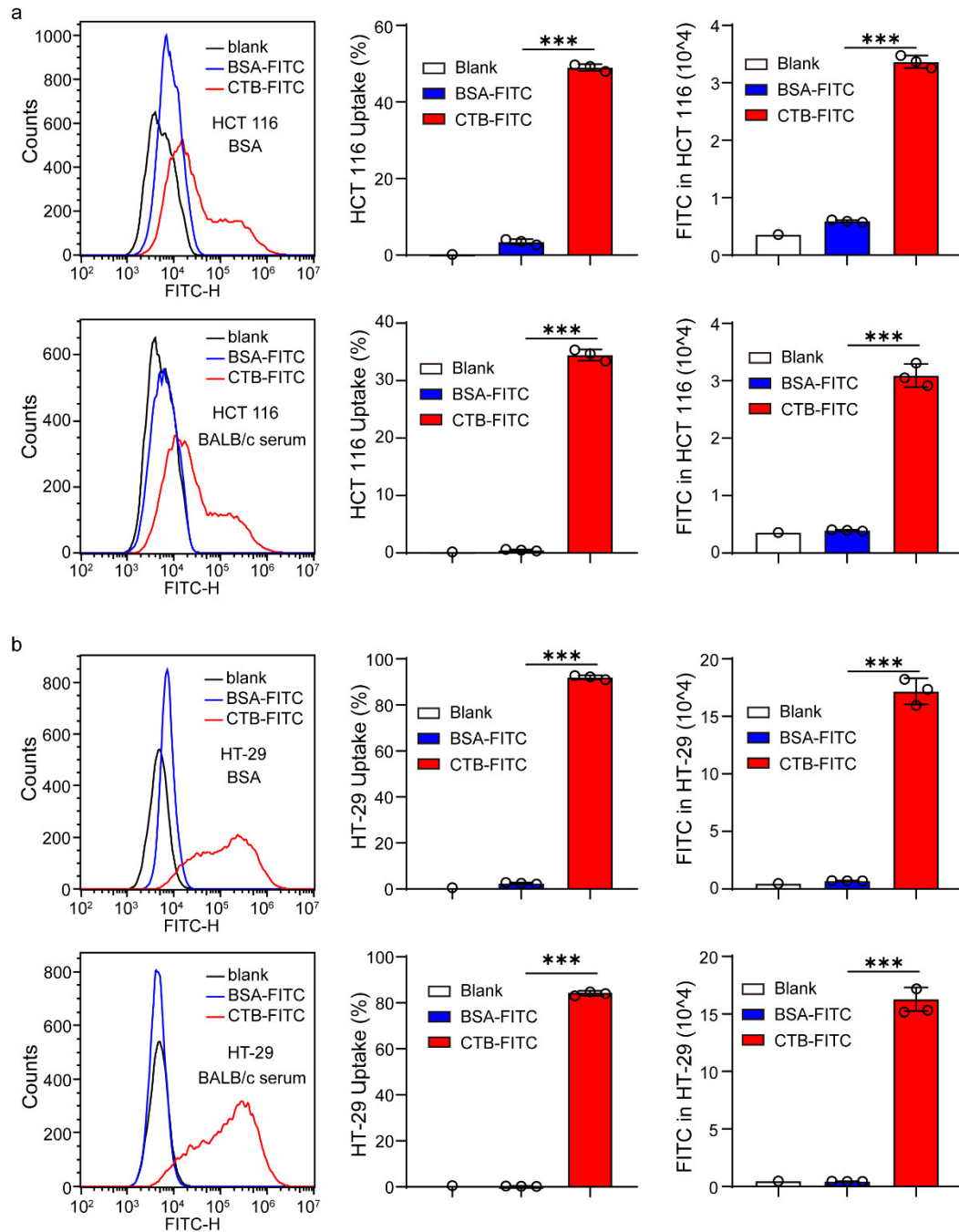
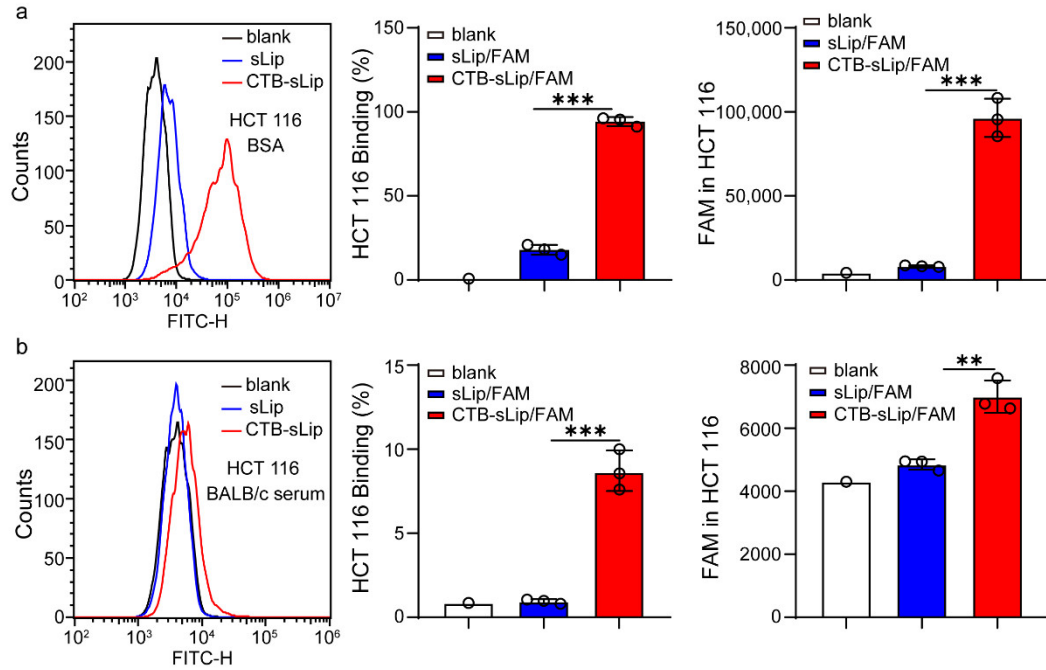


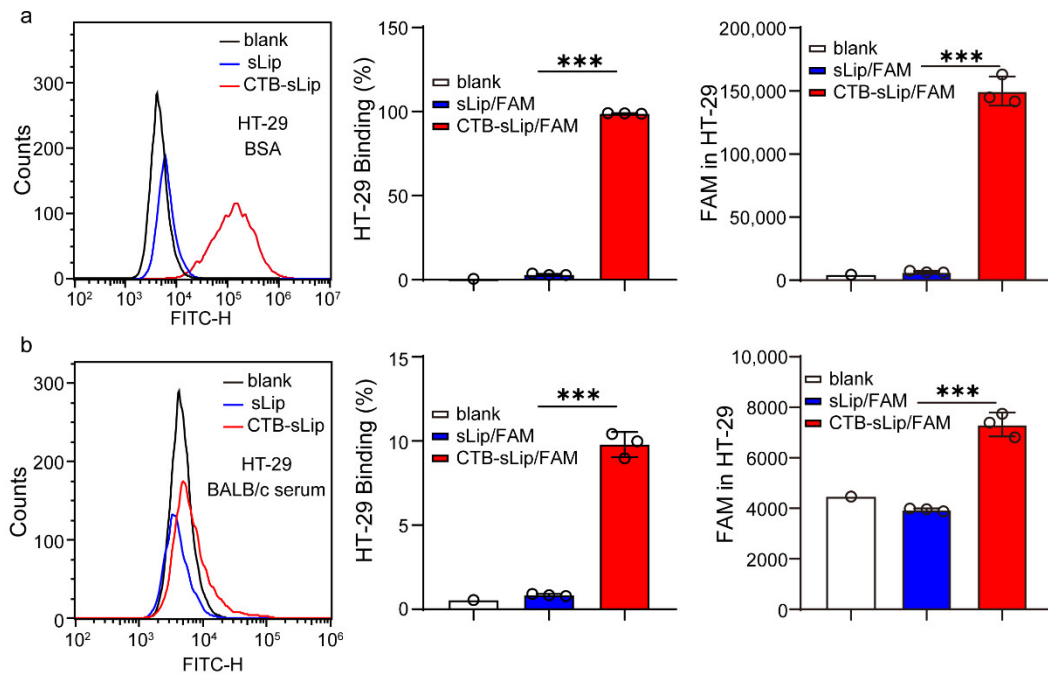
**Supplementary Figure S1.** Characterization of liposomes stability in BALB/c serum *in vitro*. sLip/Dil (a-b) or CTB-sLip/Dil (c-d) were incubated with PBS or BALB/c serum at room temperature for 24 h. The solution were 1000 times diluted and analyzed with NTA instrument.



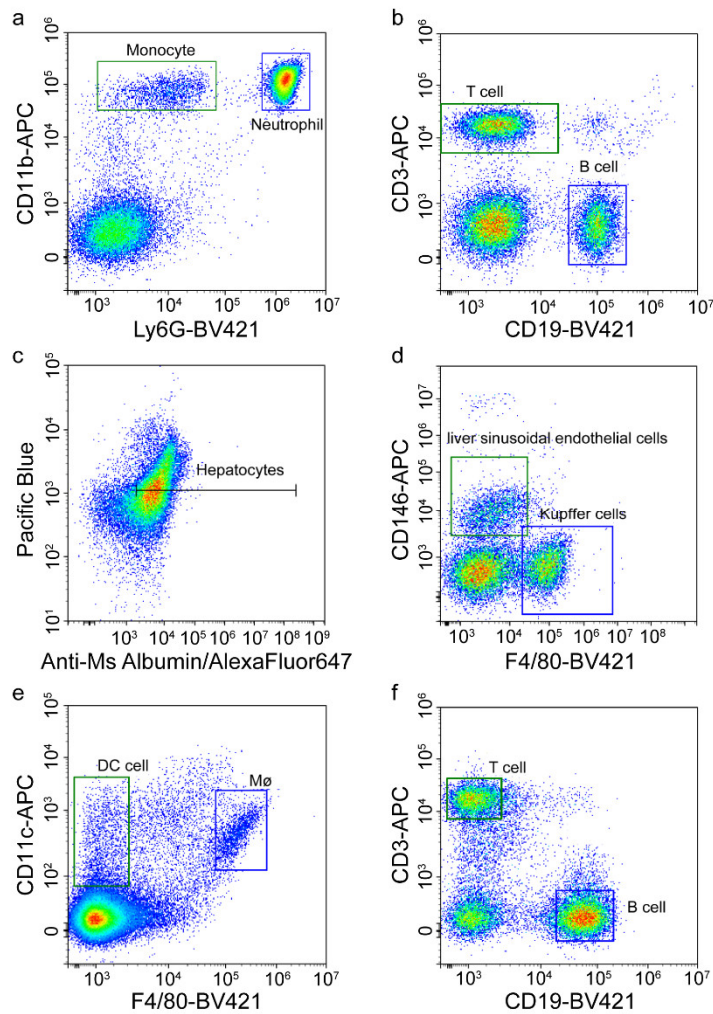
**Supplementary Figure S2.** The uptake capability of CTB protein to HCT 116 and HT-29 cells *in vitro*. HCT 116 cells (a) and HT-29 cells (b) were cultured and seeded with  $3 \times 10^5$  cells in 12-well plates ( $n = 3$ ). CTB-FITC was incubated with cells with the concentration of  $1 \mu\text{M}$  at  $37^\circ\text{C}$  for 2 h, and BSA-FITC was control. The blank for each cell line is the same when comparing the difference between BSA and BALB/c serum. Data are means  $\pm$  SDs. \*\*\*  $p < 0.001$  by one-way ANOVA analyses with Prism.8.0.1.



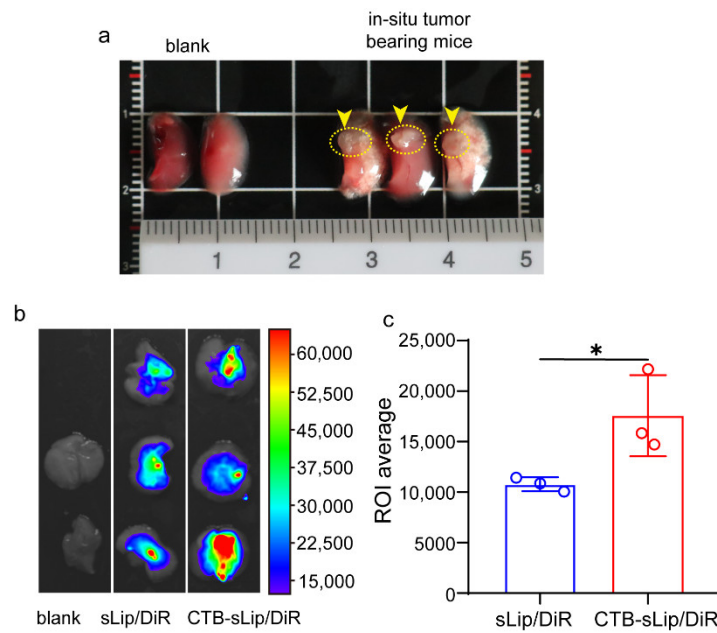
**Supplementary Figure S3.** The binding capability of CTB-sLip to HCT 116 cells *in vitro*. FAM loaded liposomes (5  $\mu$ M FAM) were incubated with HCT 116 cells in 0.1 % BSA (a) and 10 % BALB/c serum (b) at 4  $^{\circ}$ C for 2 h (n=3). Data are means  $\pm$  SDs. \*\*  $p < 0.01$  and \*\*\*  $p < 0.001$  by one-way ANOVA analyses with Prism.8.0.1.



**Supplementary Figure S4.** The binding capability of CTB-sLip to HT-29 cells *in vitro*. FAM loaded liposomes (5  $\mu$ M FAM) were incubated with HT-29 cells in 0.1 % BSA (a) and 10 % BALB/c serum (b) at 4  $^{\circ}$ C for 2 h (n=3). The blank is the same when comparing the difference between BSA and BALB/c serum. Data are means  $\pm$  SDs. \*\*\*  $p < 0.001$  by one-way ANOVA analyses with Prism.8.0.1.



**Supplementary Figure S5.** Characterization of antibody strained cells by flow-cytometry. (a-b) The strained cells of peripheral blood cells (monocyte, neutrophil, T cells and B cells). (c-d) The strained cells of liver cells (hepatocytes, LSEC and Kupffer cells). (e-f) The strained cells of splenic cells (DC cells, Mφ, T cells and B cells).



**Supplementary Figure S6.** Targeting capability of CTB-sLip to lung metastasis of colorectal cancer *in vivo*. (a) Male BALB/c nude mice planted with HCT-116 cells in left lungs. Tumor tissues are indicated by yellow arrows. (b) Xenografted mice were injected with sLip/DiR or CTB-sLip/DiR (50 mg lipid per kg of mice weight), and the whole left lung with implanted colorectal cancer cells was dissected for *in situ* imaging. (c) The fluorescence DiR in Region of Interest (ROI) was calculated from (b). Data are means  $\pm$  SDs ( $n = 3$ ). \*  $p < 0.05$  by student t-tests.