Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B.

Supporting Information

for

Transglutaminase mediated PEGylation of nanobody for targeted nano-drug delivery

$$\text{HSA-SH + DTNB} \longrightarrow \text{HSA-S-S-TNB + TNB} \quad (1)$$

$$\text{HSA-S-S-TNB + Nb-SH} \longrightarrow \text{HSA-S-S-Nb + TNB} \quad (2)$$

$$\text{HSA-S-S-Nb} \xrightarrow[\text{GSH/AsA}]{} \text{HSA-SH + Nb-SH} \quad (3)$$

Figure S1. Illustration of the formation of HSA-Nb conjugates via hetero-disulfide bonds by DTNB and the reduction by reducing agents.

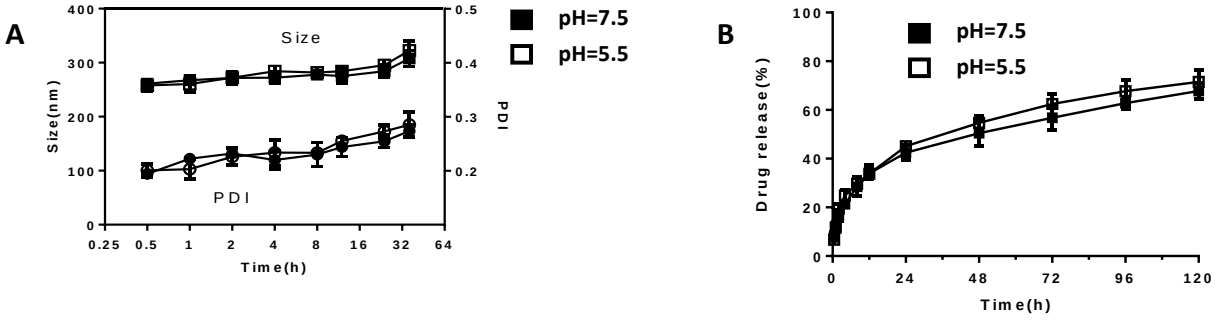

Figure S2. A) The time dependent measurement of particle size and PDI of Nb(PEG)/DOX/HSA-UCNPs. Particles were incubated in DMEM medium containing 10% FBS at 37 °C. Error bars denote standard deviations of three independent experiments. B) In vitro drug release of DOX from Nb(PEG)/DOX/HSA-UCNPs in PBS at 37 °C. Error bars denote standard deviations of three independent experiments.

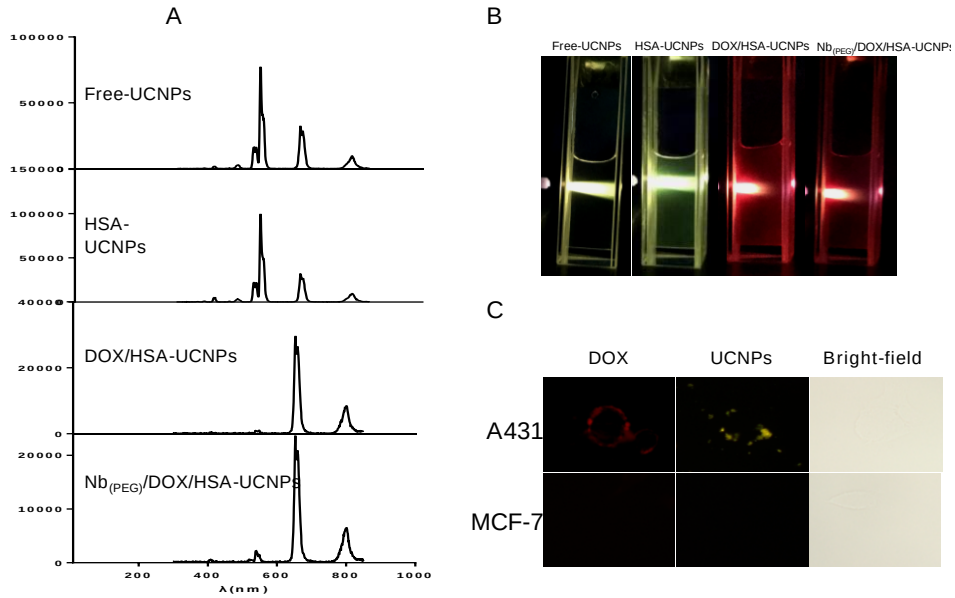

Figure S3. The upconversion emission spectrum of $Nb_{(PEG)}$/DOX/HSA-UCNPs. (A) The upconversion fluorescence spectra of free UCNPs, HSA-UCNPs, DOX/HSA-UCNPs and $Nb_{(PEG)}$/DOX/HSA-UCNPs at the same concentration (2 mg/mL) under excitation with a 980 nm laser. (B) Photos of free UCNPs, HSA-UCNPs, DOX/HSA-UCNPs and $Nb_{(PEG)}$/DOX/HSA-UCNPs under excitation with a 980 nm laser. (C) Fluorescence images of A431 cells and MCF-7 cells incubated with $Nb_{(PEG)}$/DOX/HSA-UCNPs (1.5 mg/mL) at 4 °C for 3 h under excitation of 561 nm for DOX and 980 nm for upconversion.

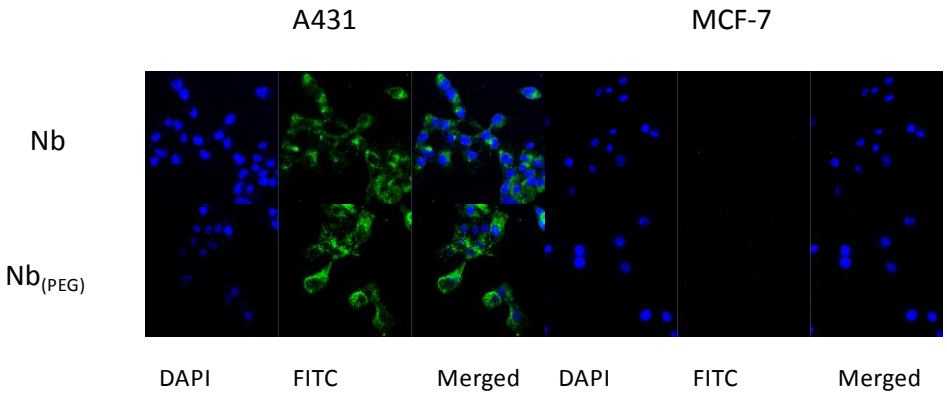

Figure S4. Cellular binding and internalizing measurements. CLSM images of Nb and $Nb_{(PEG)}$ on A431 cells and MCF-7 cells.