Supporting information

Integration of Fluorescence/Photoacoustics Imaging and Targeted Chemo/Photothermal Therapy with Ag_2Se@BSA-RGD Nanodots

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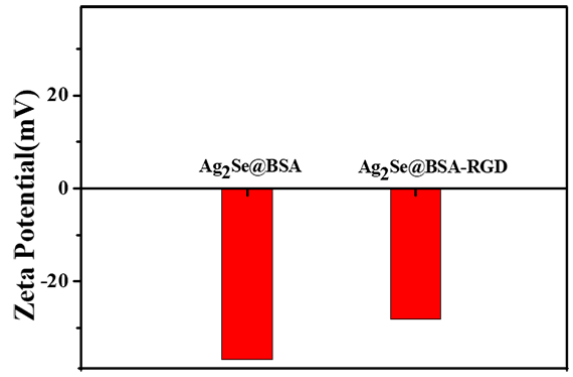

Fig. S1 Zeta potential of Ag_2Se@BSA and Ag_2Se@BSA-RGD QDs.

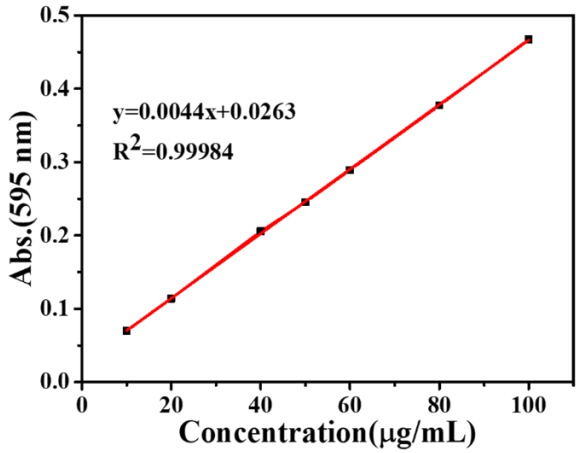

Fig. S2 Standard adsorption curve of G250 with RGD at 595 nm.

The modification RGD molecules on QDs was calculated as the following equation:

$$\frac{\text{Total RGD added} - \text{RGD in supernatant}}{Ag_2\text{Se@BSA QDs}}$$

The RGD content in the supernatant was detected and calculated according to the standard working curve of RGD. And the mass ratio of total added RGD and Ag_2Se@BSA QDs is 1: 5.

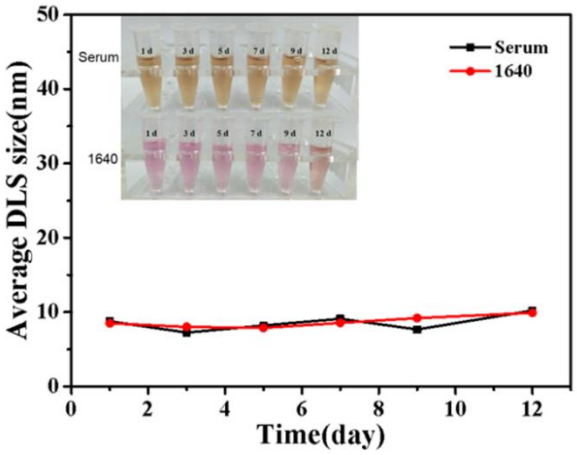

Fig. S3 Evaluation the stability of Ag_2Se@BSA-RGD QDs in the serum and RPMI 1640 medium.

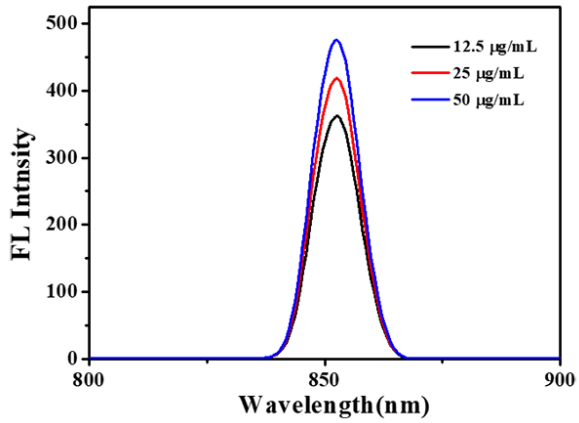

Fig. S4 Fluorescence spectrums of Ag_2Se@BSA QDs with different concentration.

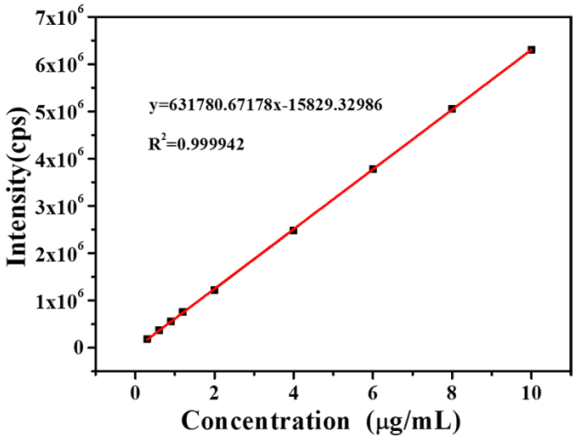

Fig. S5 ICP-AES quantitative fitting of the standard curve of Ag^{+}.

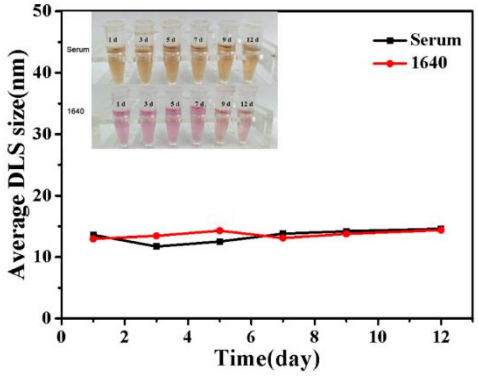

Fig. S6 Stability of Ag_2Se@BSA-DOX during the incubation with serum or RPMI 1640 medium for 12 days, respectively.

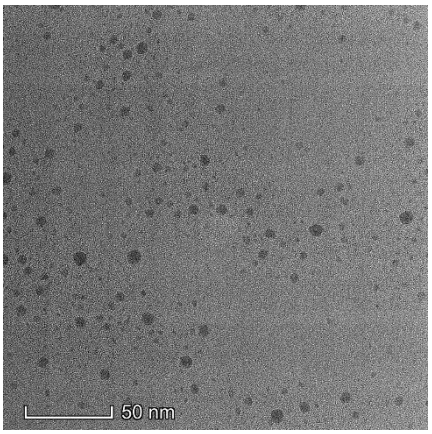

Fig. S7 TEM image of Ag_2Se@BSA-DOX-RGD.

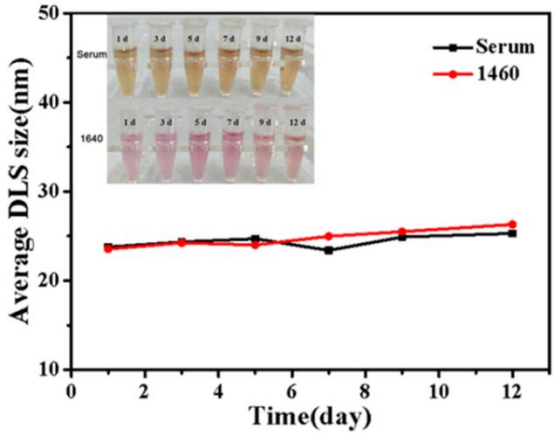

Fig. S8 Stability of Ag_2Se@BSA-DOX-RGD during the incubation with serum or RPMI 1640 medium for 12 days，respectively.

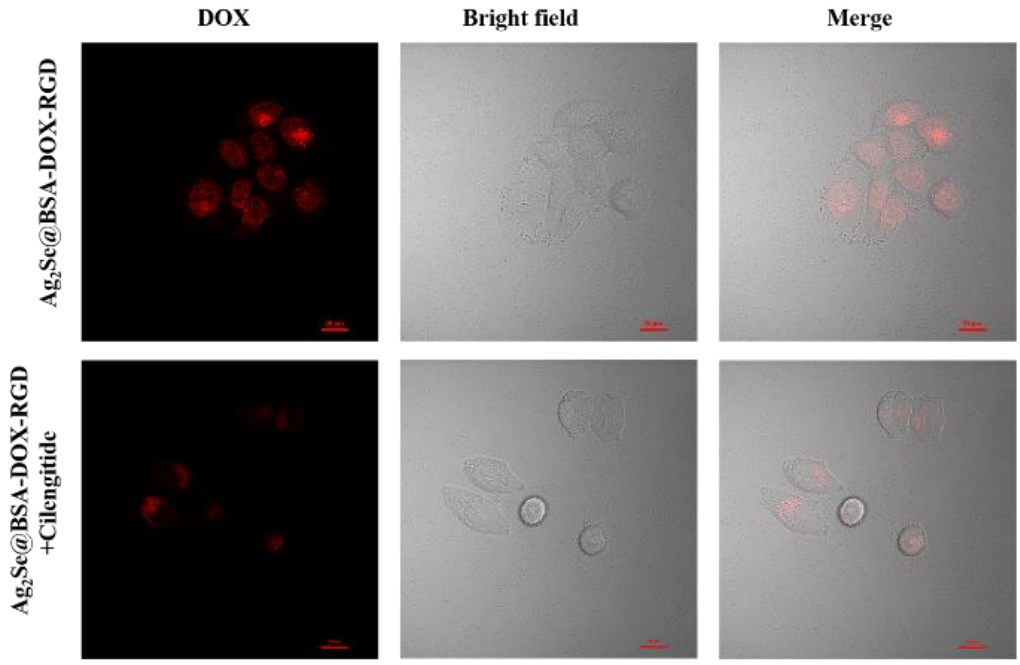

Fig. S9 CLSM image of Ag_2Se@BSA-DOX-RGD QDs incubated with HeLa cells for 4 h, the first to third columns are dark field, bright field, and Merge field, respectively. The concentration of Ag^+ and DOX in all the groups are 1.39 mM and 5 μg/mL. The content of cilengitide is 50 μM.

1. Determining fluorescence quantum yield of Ag_2Se@BSA QDs

The quantum yield (QY) of as-synthesized Ag_2Se@BSA QDs was measured using indocyanine green (ICG) as a reference (QY=13% in DMSO). The absorption spectra of the Ag_2Se QDs and ICG solutions were recorded. Then the fluorescence spectra of these samples were recorded under the same excitation. The fluorescence quantum yield was calculated according to the following equation:

$$\emptyset_{QD} = \emptyset_{ICG}\left(\frac{F_{QD}}{F_{ICG}}\right)\left(\frac{A_{ICG}}{A_{QD}}\right)\left(\frac{n_{QD}}{n_{ICG}}\right)^2$$

Where $\emptyset_{QD}, F_{QD}, A_{ICG}, n_{QD}$ are the quantum yield (QY), integrated fluorescence intensity, integrated absorption and refractive index of the solvent for the Ag_2Se QDs. The parameters with a subscript of ICG are corresponding quantities of ICG. All data are measured three times and averaged.

2. Calculation of the photothermal conversion efficiency（PTCE）

The formula of the photothermal conversion efficiency is as following:

$$\eta = \frac{\sum m_i c_i (T_{max} - T_{max,H_2O})}{\tau_s I(1-10^{-A_{808}})}$$

With τ_s is equal to 500 s, m is 1.0 g and C is 4.2 J/g, Substituting I = 2.0 W, A_{808} = 0.2842, $T_{max} - T_{max,H_2O}$ = 58.8-27=31.8 ℃ into above formula, PTCE=(0.0084*31.8)/(2*(1-$10^{-0.2842}$)=27.8%