

Supporting Information

Hedgehog-inspired immunomagnetic beads for high-efficient capture and release of exosomes

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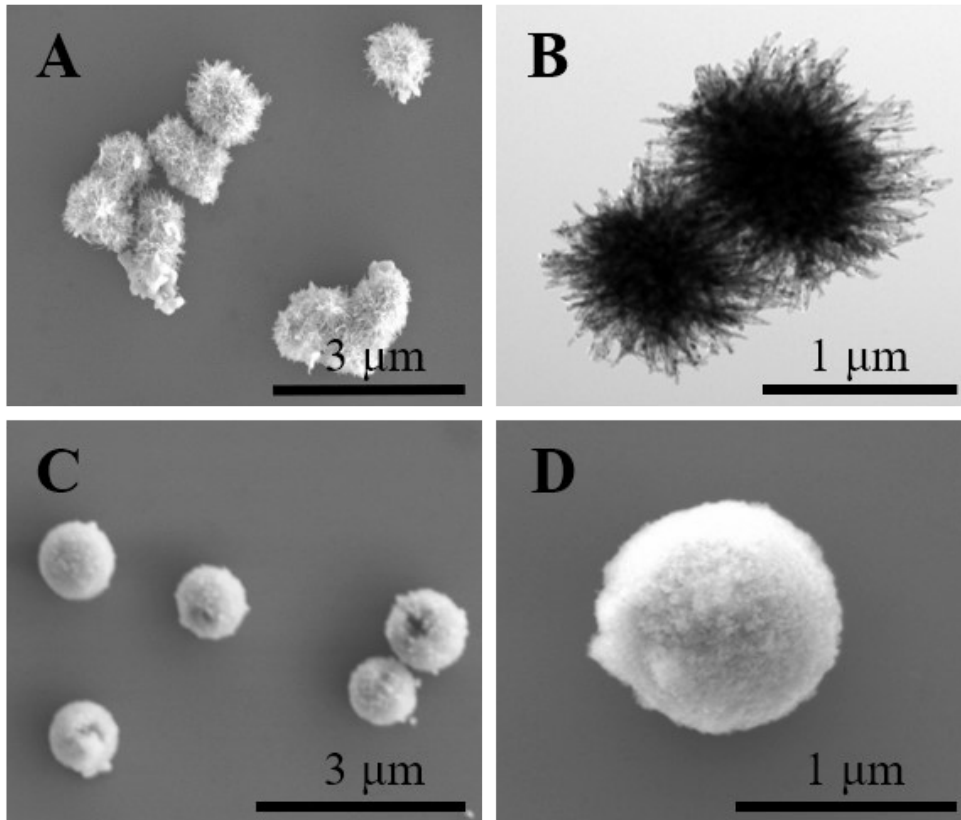


Fig. S1 (A) SEM and (B)TEM images of TiO_2 HPs. (C-D) SEM images of $\text{SiO}_2@Fe_3O_4$ MPs.

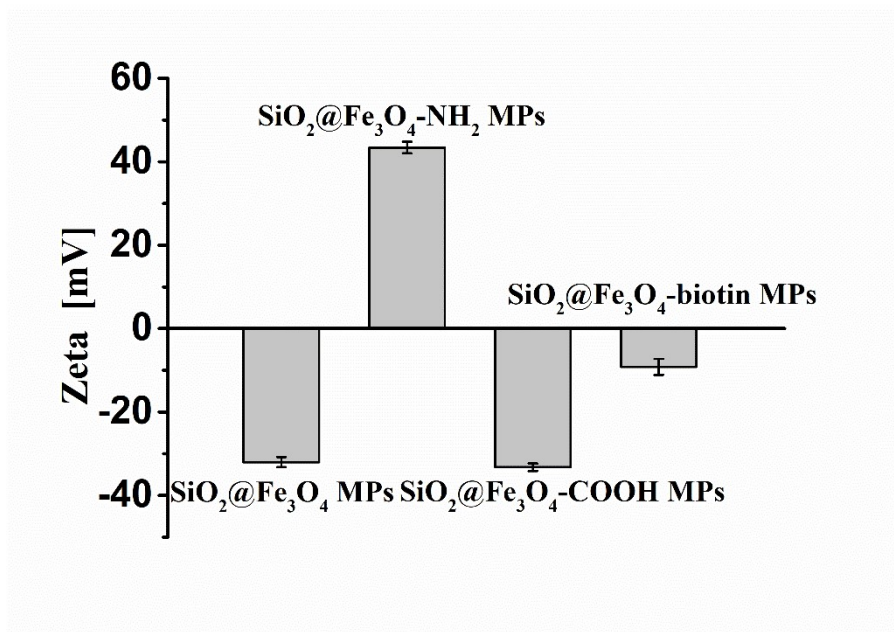


Fig. S2 Zeta potential measurements of the $\text{SiO}_2@Fe_3O_4$ MPs, $\text{SiO}_2@Fe_3O_4-NH_2$ MPs, $\text{SiO}_2@Fe_3O_4-COOH$ MPs, $\text{SiO}_2@Fe_3O_4$ -biotin MPs.

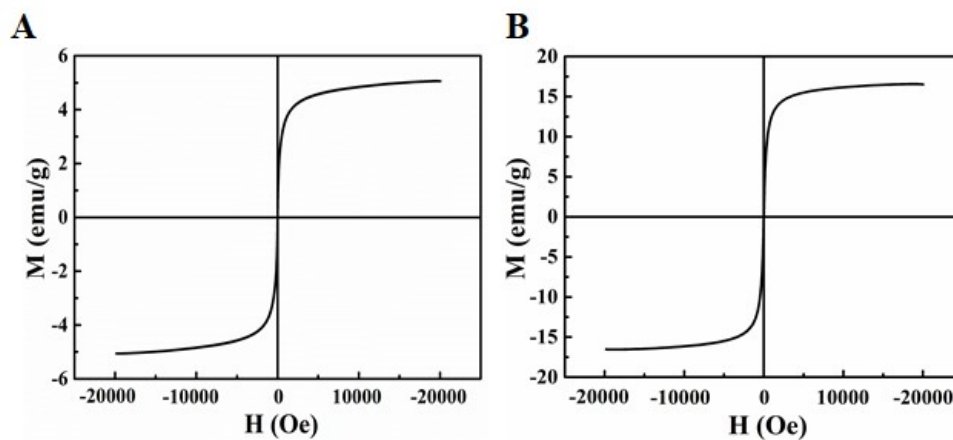


Fig. S3. Magnetic hysteresis loops of (A) $\text{TiO}_2@Fe_3O_4$ -biotin MPs and (B) $\text{SiO}_2@Fe_3O_4$ -biotin MPs.

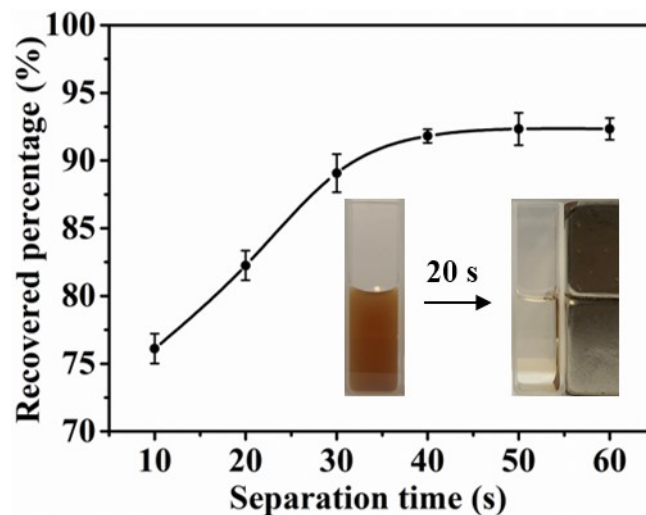


Fig. S4 The recovery percentage of $\text{SiO}_2@Fe_3O_4$ -biotin MPs at different separation times; the inset graph shows the magnetic separation process.

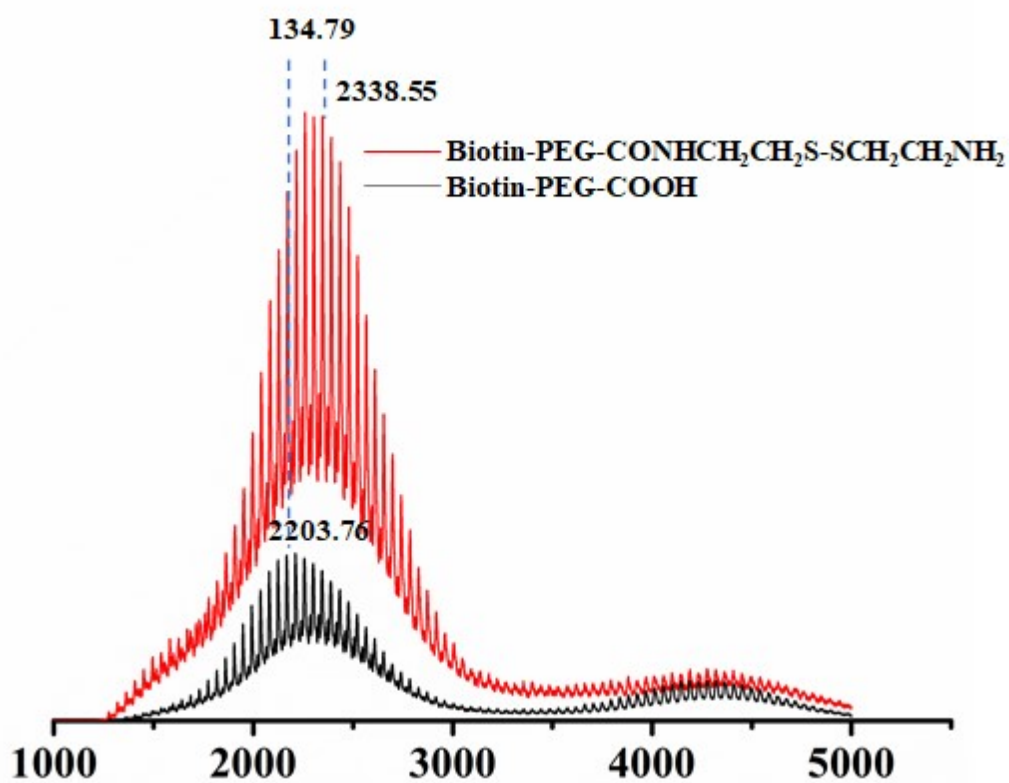


Fig. S5 MALDI-TOF-MS spectra of biotin-PEG-COOH and biotin-PEG-CONHCH₂CH₂S-SCH₂CH₂NH₂.

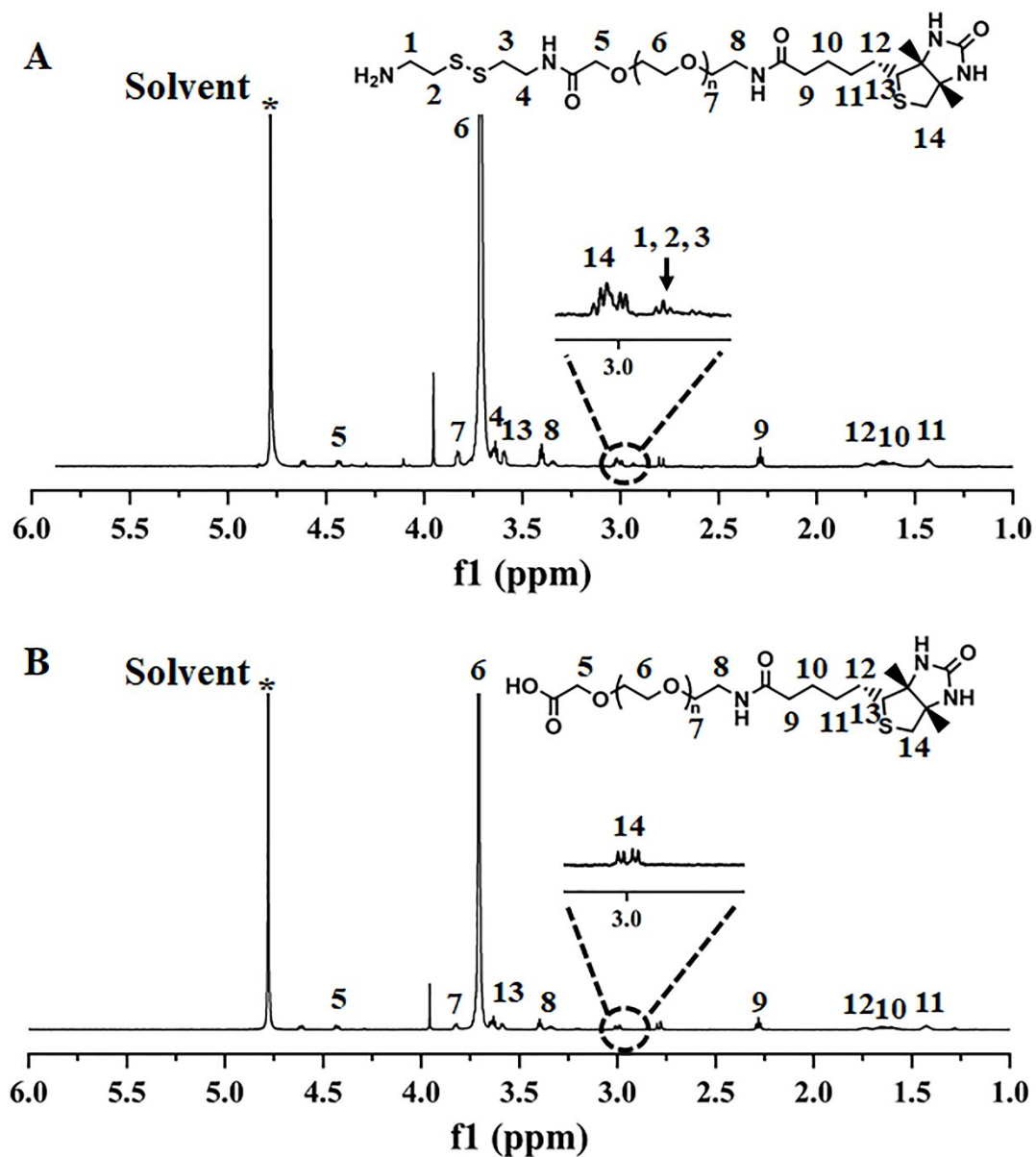


Fig. S6 ^1H NMR spectra (600 MHz, D_2O , room temperature) of (A) biotin-PEG- $\text{CONHCH}_2\text{CH}_2\text{S-SCH}_2\text{CH}_2\text{NH}_2$ and (B) biotin-PEG-COOH.

^1H NMR spectra verified that the biotin-PEG- $\text{CONHCH}_2\text{CH}_2\text{S-SCH}_2\text{CH}_2\text{NH}_2$ was successfully obtained through condensation reaction between biotin-PEG-COOH and biotin- $\text{NH}_2\text{CH}_2\text{CH}_2\text{S-SCH}_2\text{CH}_2\text{NH}_2$. The chemical shifts at δ 2.80-2.95 (ppm) confirmed the successful conjugation of the $\text{NH}_2\text{CH}_2\text{CH}_2\text{S-SCH}_2\text{CH}_2\text{NH}_2$ onto the terminal of biotin-PEG-COOH.

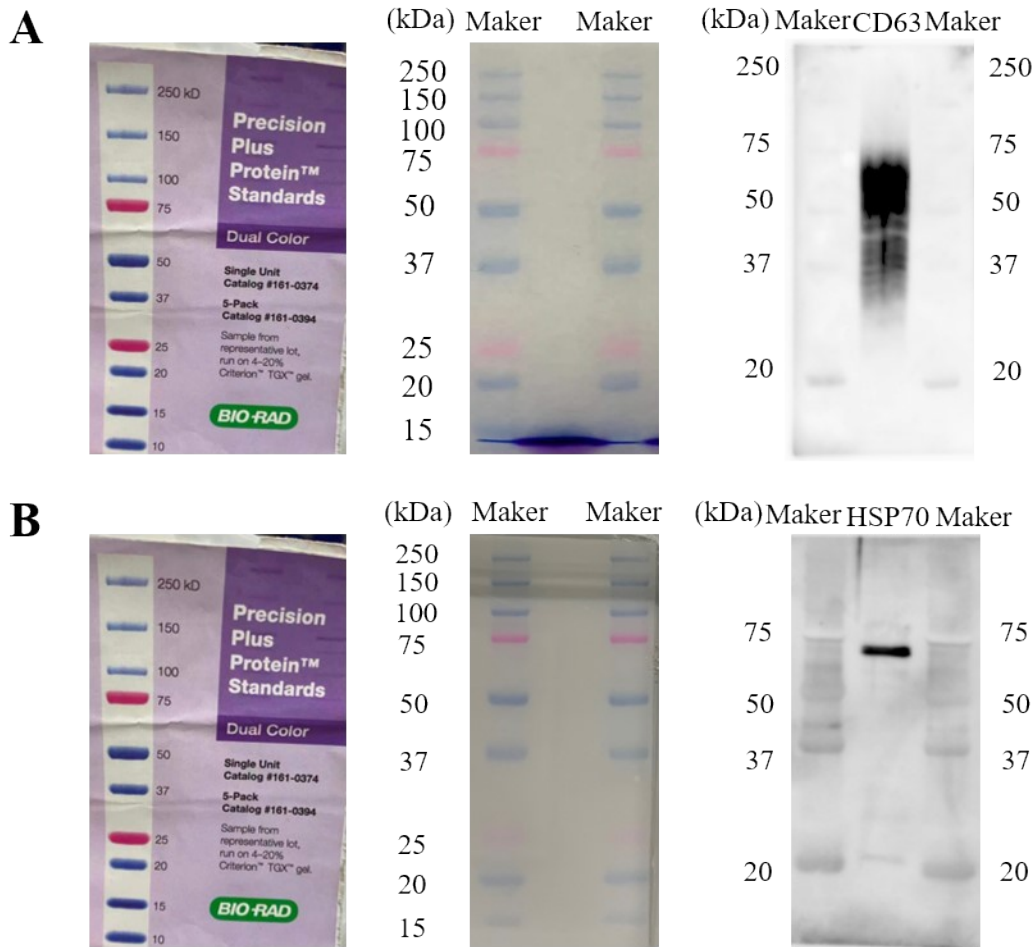


Fig. S7 Raw data of the western blot results, (A) CD63 and (B) HSP70.

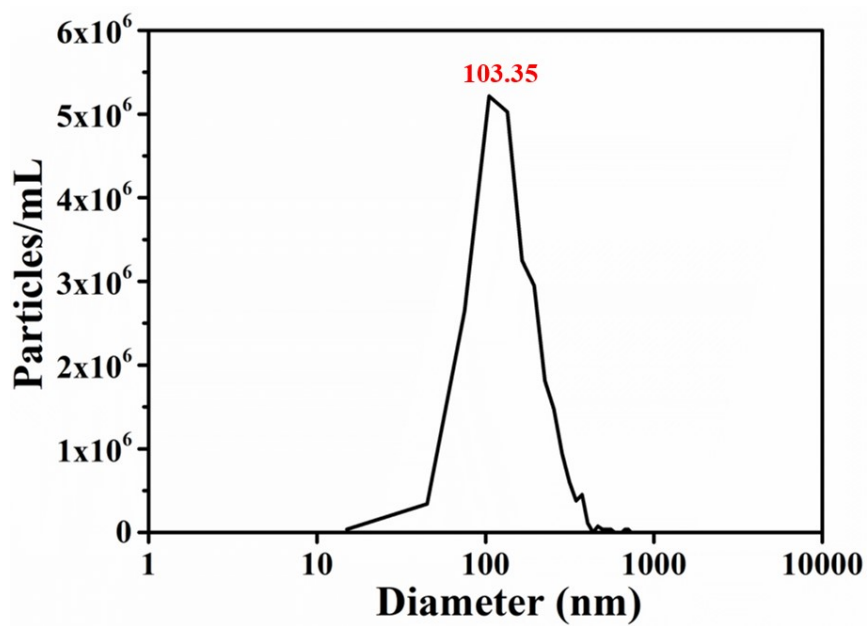


Fig. S8 The size distribution of the released MCF-7 exosomes by NTA.