

## SUPPLEMENTARY INFORMATION

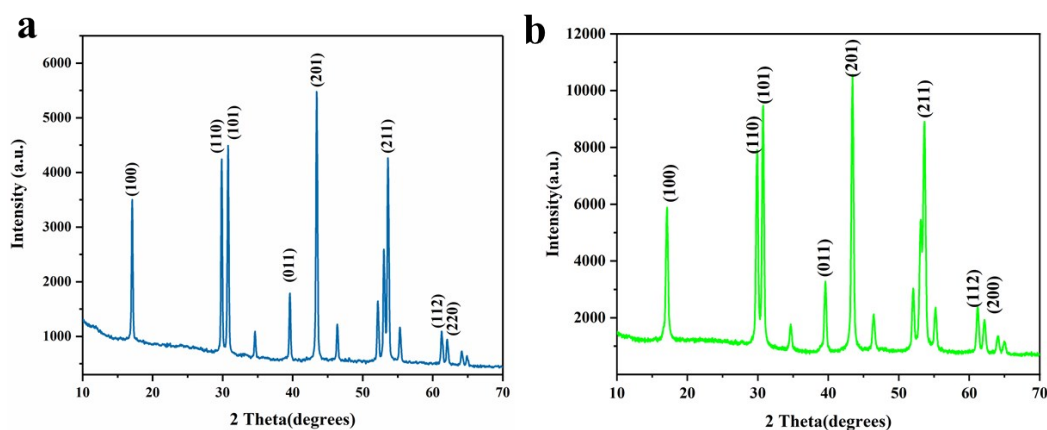
### **A highly sensitive immunofluorescence sensor based on bicolor upconversion and magnetic separation for simultaneous detection of fumonisin B1 and zearalenone**

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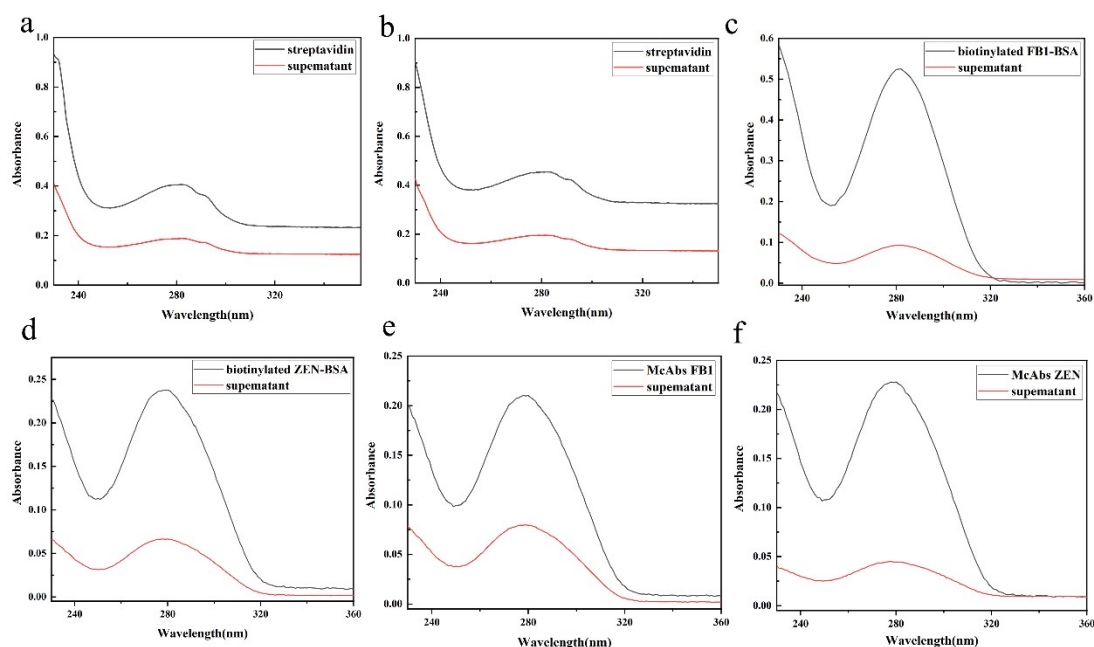
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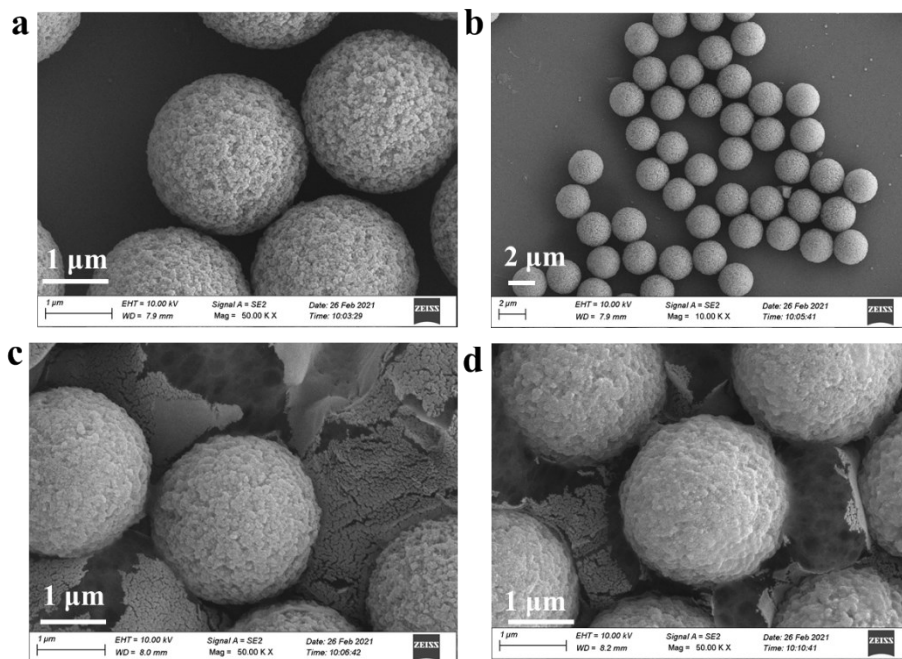
## SUPPLEMENTARY FIGURES



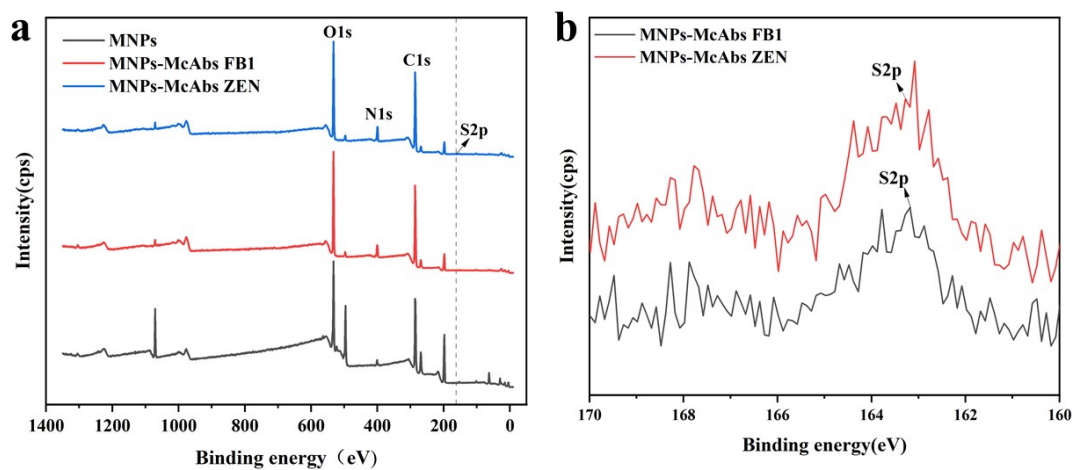
**Figure S1** XRD patterns of NaYF<sub>4</sub> UCNPs: PEI-NaYF<sub>4</sub>:Yb<sup>3+</sup>,Tm<sup>3+</sup> UCNPs(a), PEI-NaYF<sub>4</sub>:Yb<sup>3+</sup>,Er<sup>3+</sup> UCNPs(b)



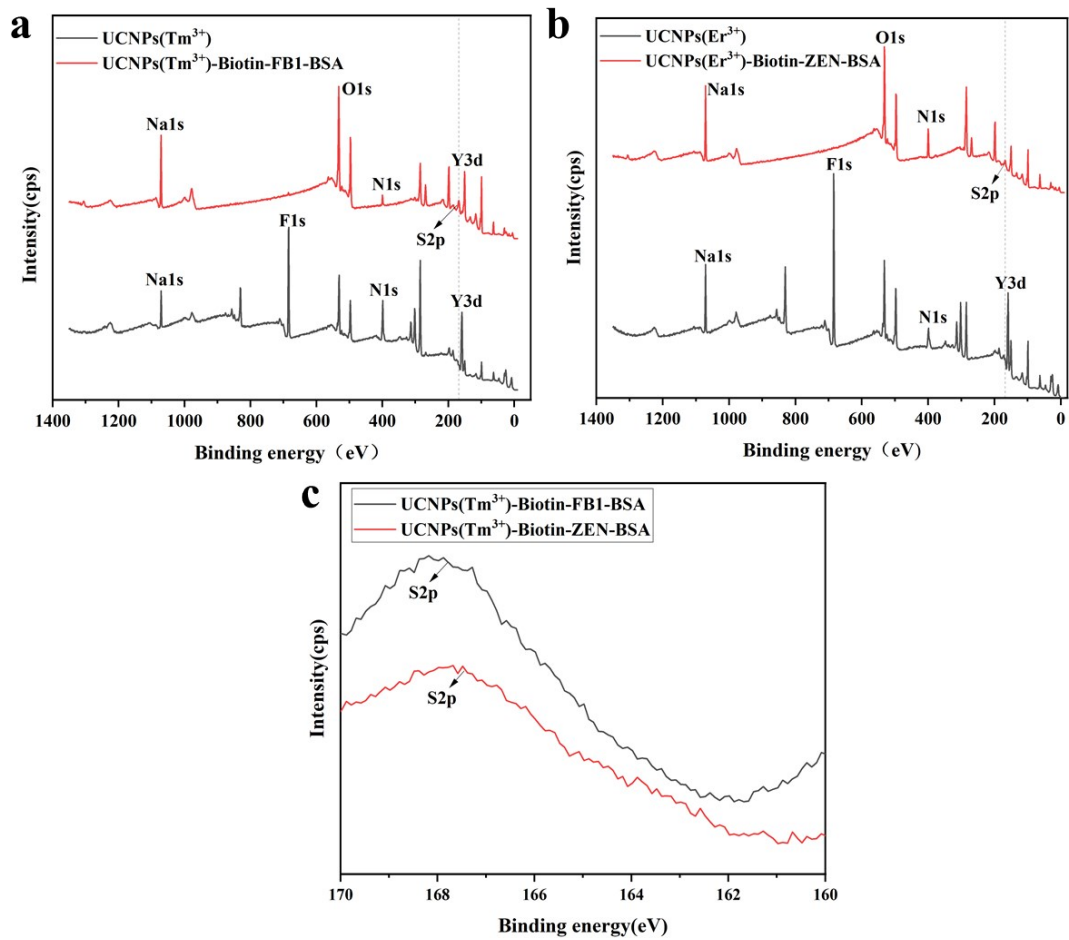
**Figure S2** Characterization of fluorescence signal probes and capture probes. UV-vis absorption spectra of streptavidin stock solution and the supernatant solution after incubated (a,b), UV-vis absorption spectra of biotinylated FB<sub>1</sub>-BSA and biotinylated ZEN-BSA stock solution and the supernatant solution after incubated (c,d), UV-vis absorption spectra of McAbs FB<sub>1</sub> and McAbs ZEN and the supernatant solution after incubated (e,f).



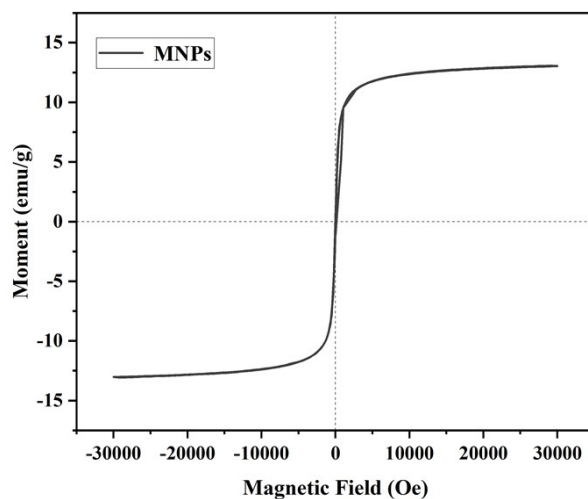
**Figure S3** Characterization of capture probes. SEM of magnetic nanoparticles(a,b); SEM of McAbs FB1 and McAbs ZEN after incubated (c,d).



**Figure S4** Characterization of capture probes. XPS of magnetic nanoparticles ,MNPs-McAbs FB1 and MNPs-McAbs ZEN.



**Figure S5** Characterization of upconversion fluorescent probes. XPS spectra of UCNPs,UCNPs-Biotin-FB1-BSA and UCNPs-Biotin-ZEN-BSA.



**Figure S6** VSM spectra of magnetic nanoparticles.