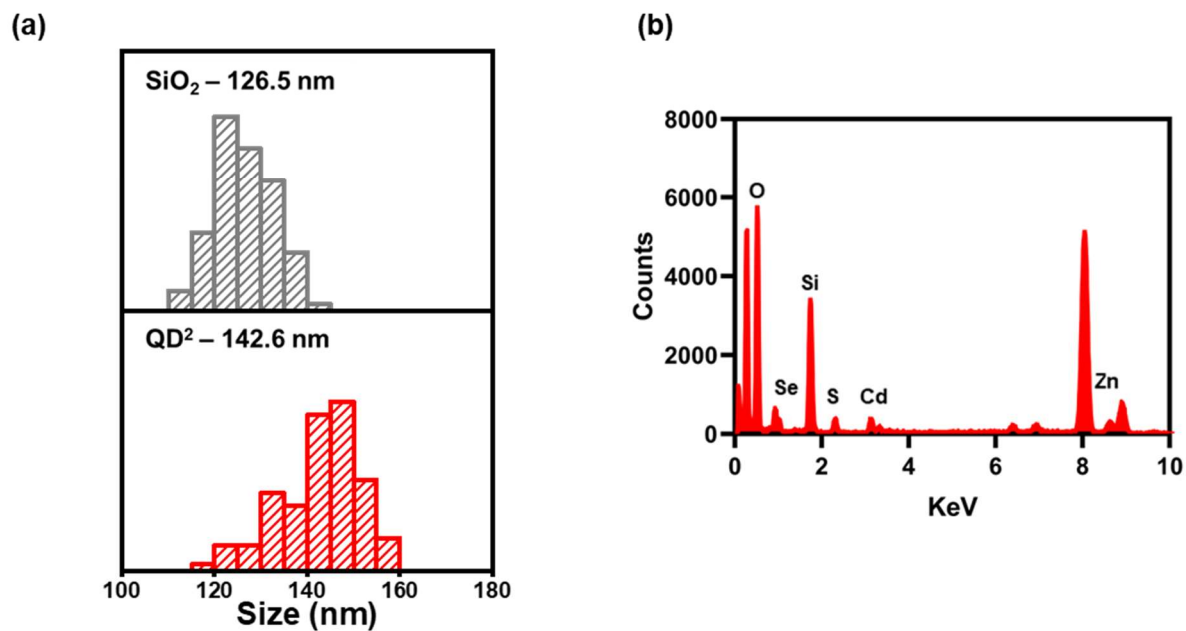
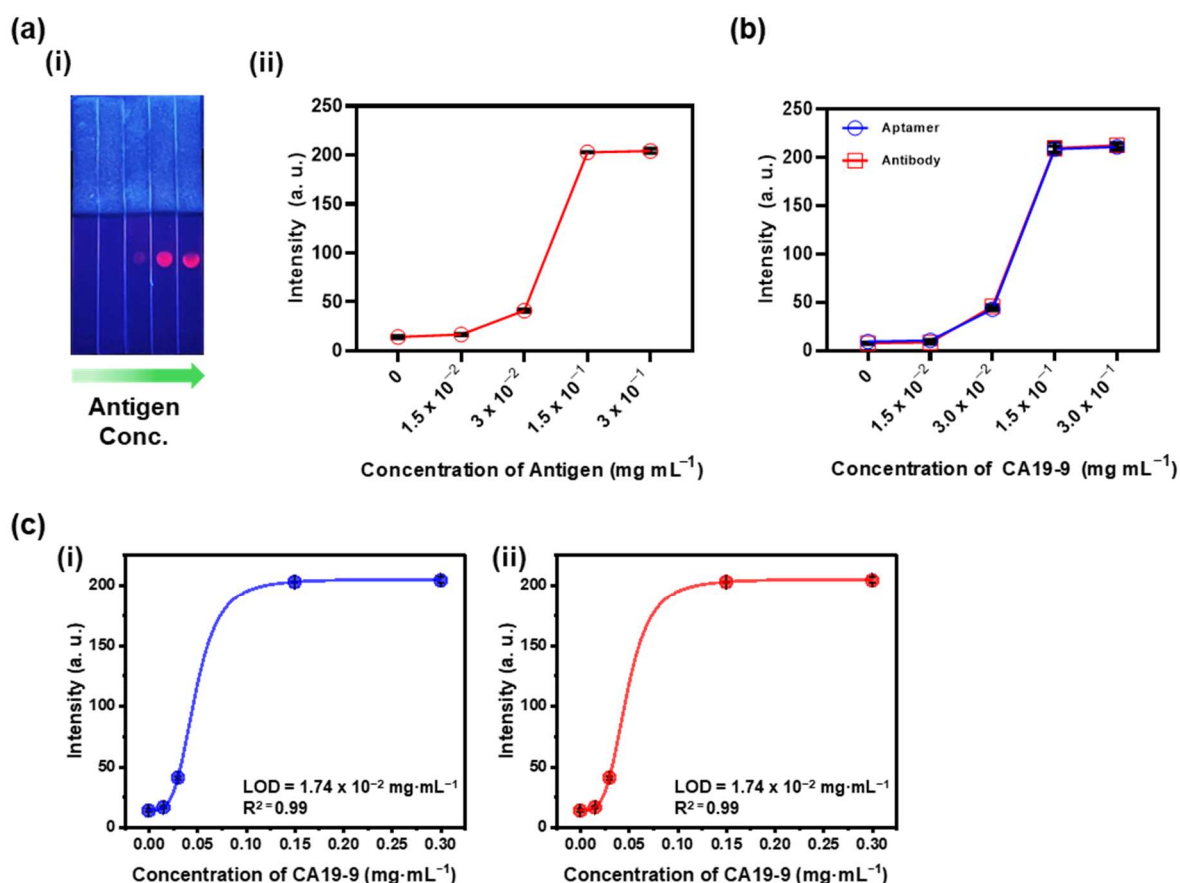


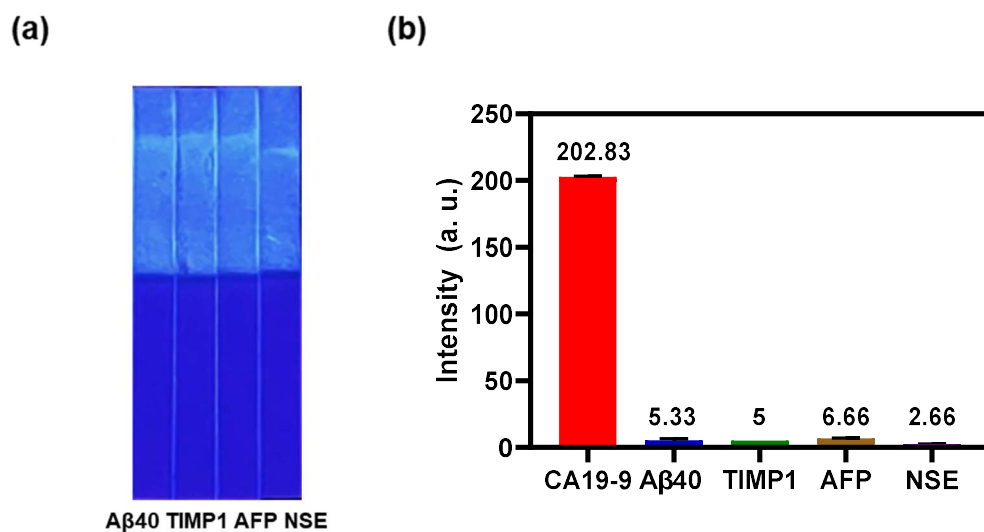
## Supplementary Materials



**Figure S1.** (a) Size distribution of  $\text{SiO}_2$  and  $\text{QD}^2$ . (b) Energy dispersive spectroscopic elemental mapping images of Si, O, Cd, Se, Zn, and S.



**Figure S2.** (a) (i) An image of a strip image detecting CA19-9 antigen at various concentrations using antibody. (a) (ii) FI measured on a strip detecting CA19-9 using QD<sup>2</sup>@PEG@Antibody. (b) FIs of QD<sup>2</sup>-PEG-Aptamer and QD<sup>2</sup>-PEG-Antibody at each CA19-9 concentration. (c) (i) Graph showing limit of detection (LOD) of QD<sup>2</sup>@PEG@Aptamer at various CA19-9 concentrations. (ii) Graph showing LOD of QD<sup>2</sup>@PEG@Antibody at various CA19-9 concentrations.



**Figure S3.** (a) Fluorescence images of QD<sup>2</sup>@PEG@Aptamer developed on different strips after drying Aβ40, TIMP1, AFP, and NSE to determine the non-specific binding of the aptamer; (b) FI measured on strips with Aβ40, TIMP1, AFP, and NSE.