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Electronic Supplementary Materials

Using Fluoro Modified RNA Aptamers as Affinity Ligands on Magnetic Beads for Sensitive Thrombin Detection through Affinity Capture and Thrombin Catalysis

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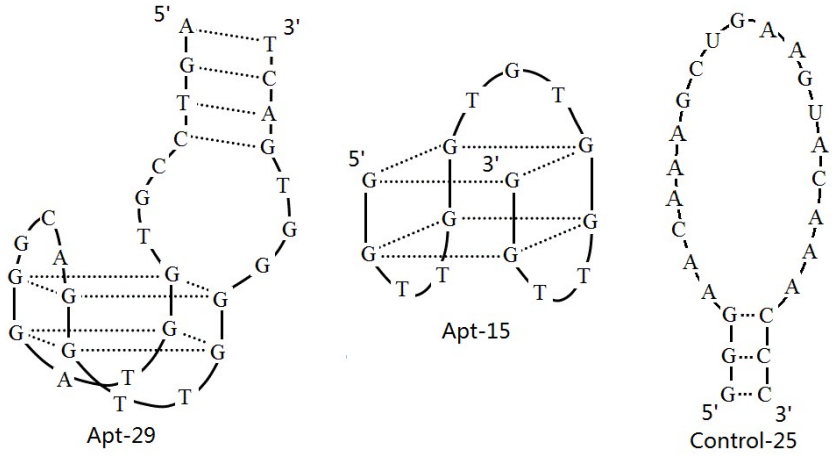

Fig. S1 Predicted structures of DNA aptamer Apt-29, DNA aptamer Apt-15, and the RNA Control-25.

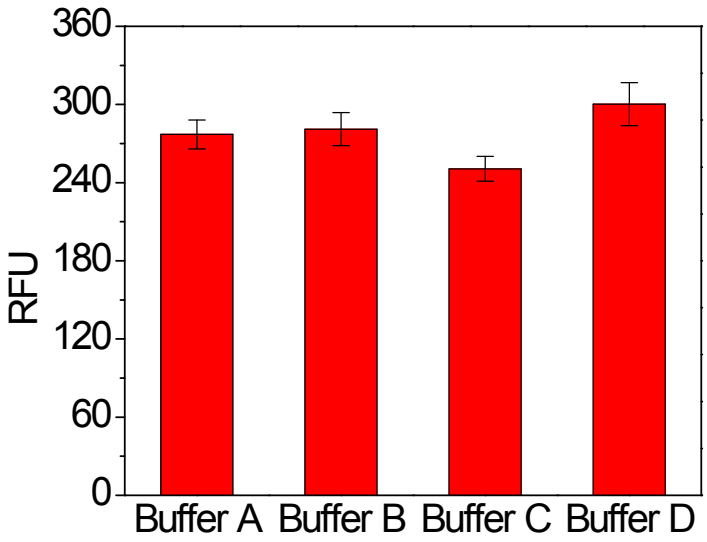

Fig. S2 Effect of types of binding buffer solution in the assay using Toggle-25 coated magnetic beads and fluorogenic substrate. Buffer A contained 20 mM Tris-HCl (pH 7.5), 150 mM NaCl, and 2 mM $CaCl_2$; Buffer B contained 20 mM Tris-HCl (pH 7.5), 150 mM NaCl, and 2 mM $MgCl_2$; Buffer C contained 20 mM HEPES (pH 7.5), 150 mM NaCl, and 2 mM $CaCl_2$; Buffer D contained 10 mM Na_2HPO_4, 2 mM KH_2PO_4, 2.7 mM KCl, 137 mM NaCl and 2 mM $MgCl_2$ (pH 7.5). The concentration of tested thrombin was 10 pM.

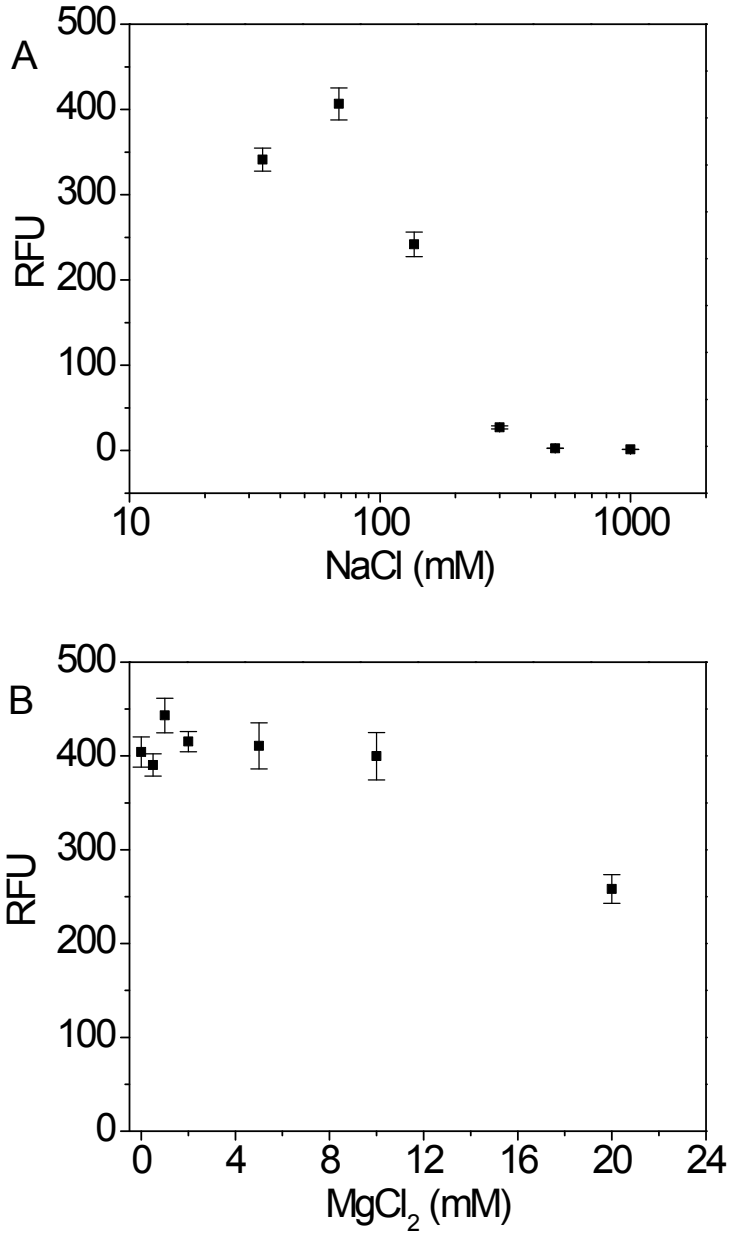

Fig. S3 (A) Effect of NaCl in the binding solution (10 mM Na_2HPO_4, 2 mM KH_2PO_4, 2.7 mM KCl, 2 mM $MgCl_2$, 1 mg/mL BSA) on the obtained signal. (B) Effect of $MgCl_2$ in the binding solution (10 mM Na_2HPO_4, 2 mM KH_2PO_4, 2.7 mM KCl, 68.5 mM NaCl, 1 mg/mL BSA, pH 7.5) on the obtained signal.

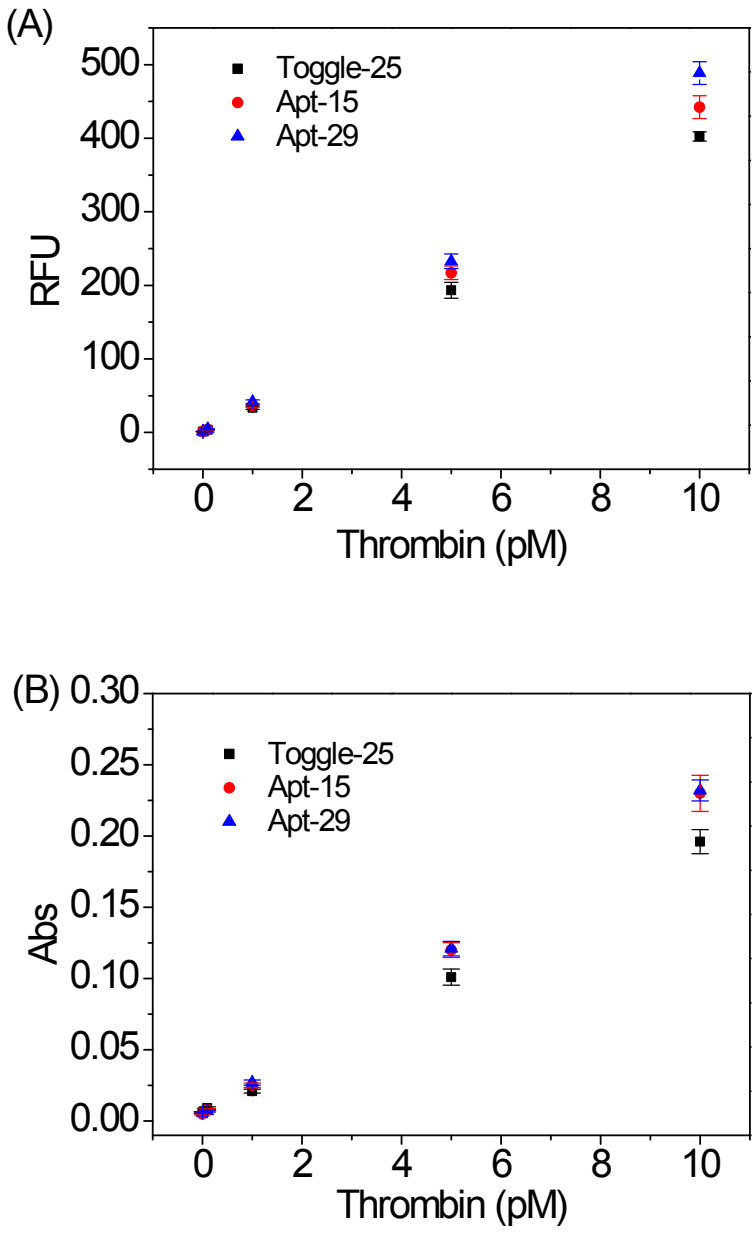

Fig. S4 Comparison of assay sensitivity for thrombin detection in assay using RNA aptamer Toggle-25, DNA aptamer Apt-15, or DNA aptamer Apt-29 as affinity ligands on magnetic beads. (A) using fluorogenic substrate in the assay; (B) using chromogenic substrate in the assay. The aptamers were conjugated on magnetic beads following the same procedure, and assays were conducted at the same conditions.

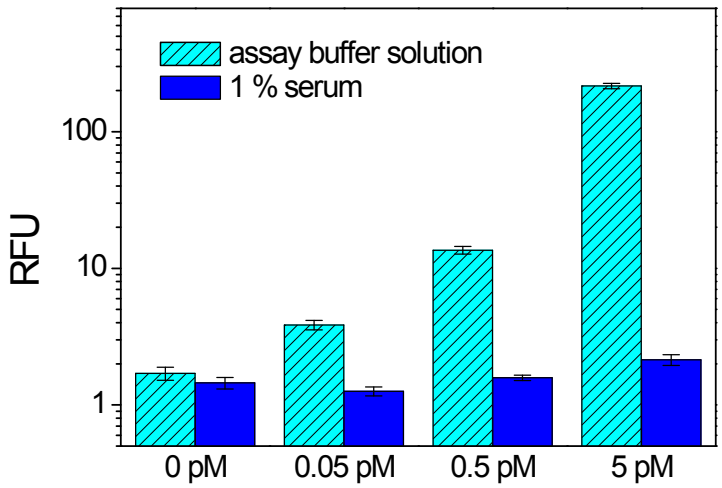

Fig. S5 Detection of thrombin in assay buffer solution or in 100-fold diluted serum by using aptamer Toggle-25-without-F coated magnetic beads and fluorogenic substrate in enzyme reaction.