Supporting Information

Molecularly Imprinted Aptamers of Gold Nanoparticles for the Enzymatic Inhibition and Detection of Thrombin

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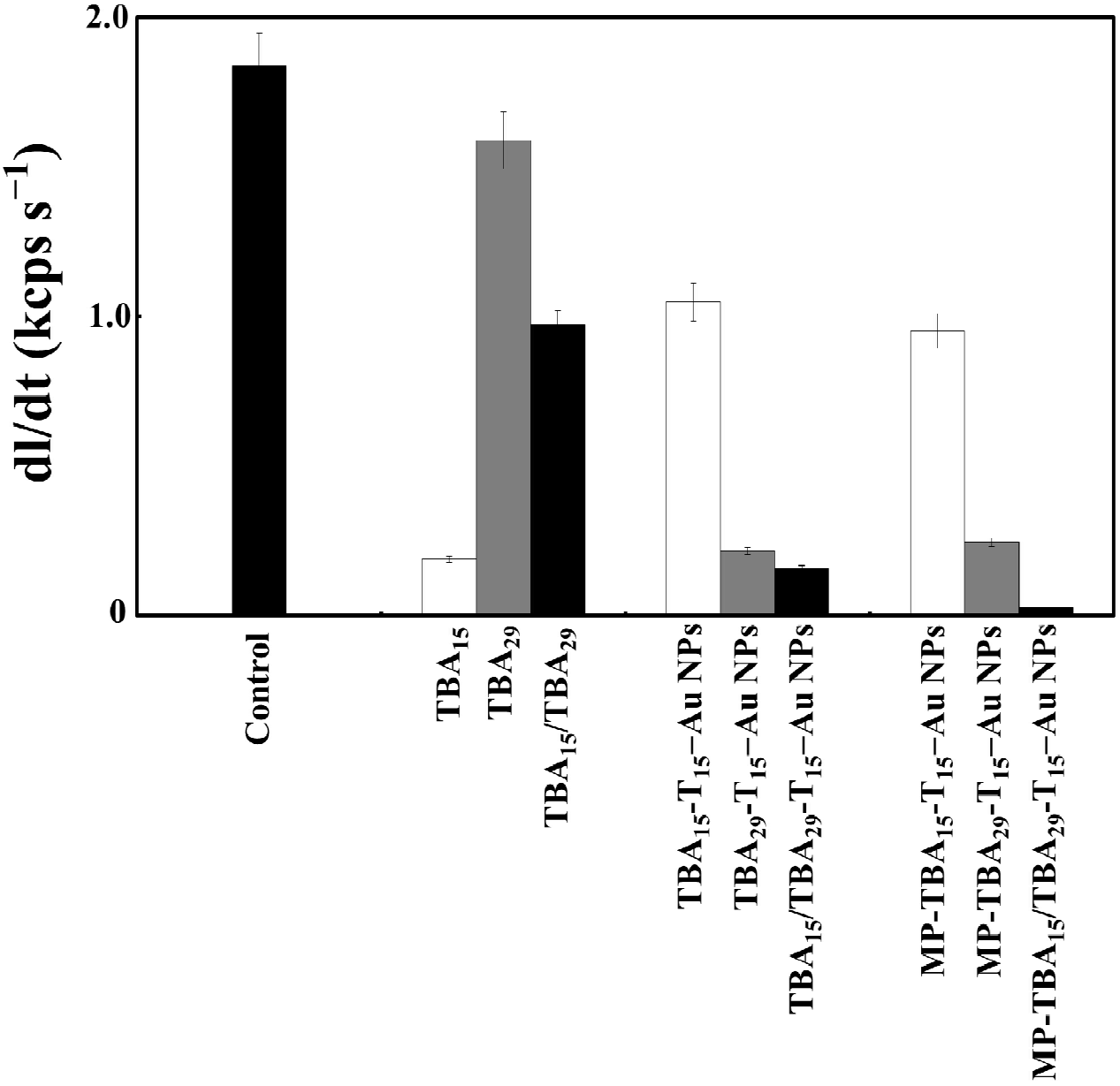

Figure S1. Initial reaction rates of the coagulation of mixtures of thrombin and fibrinogen containing various TBA, TBA-T_{15}–Au NPs, or MP-TBA-T_{15}–Au NPs in the presence of BSA (100 μM). The light scattering of each sample was monitored at 750 nm. The error bars represent the standard deviation of three repeated measurements. Other conditions were the same as those described in Figure 1.

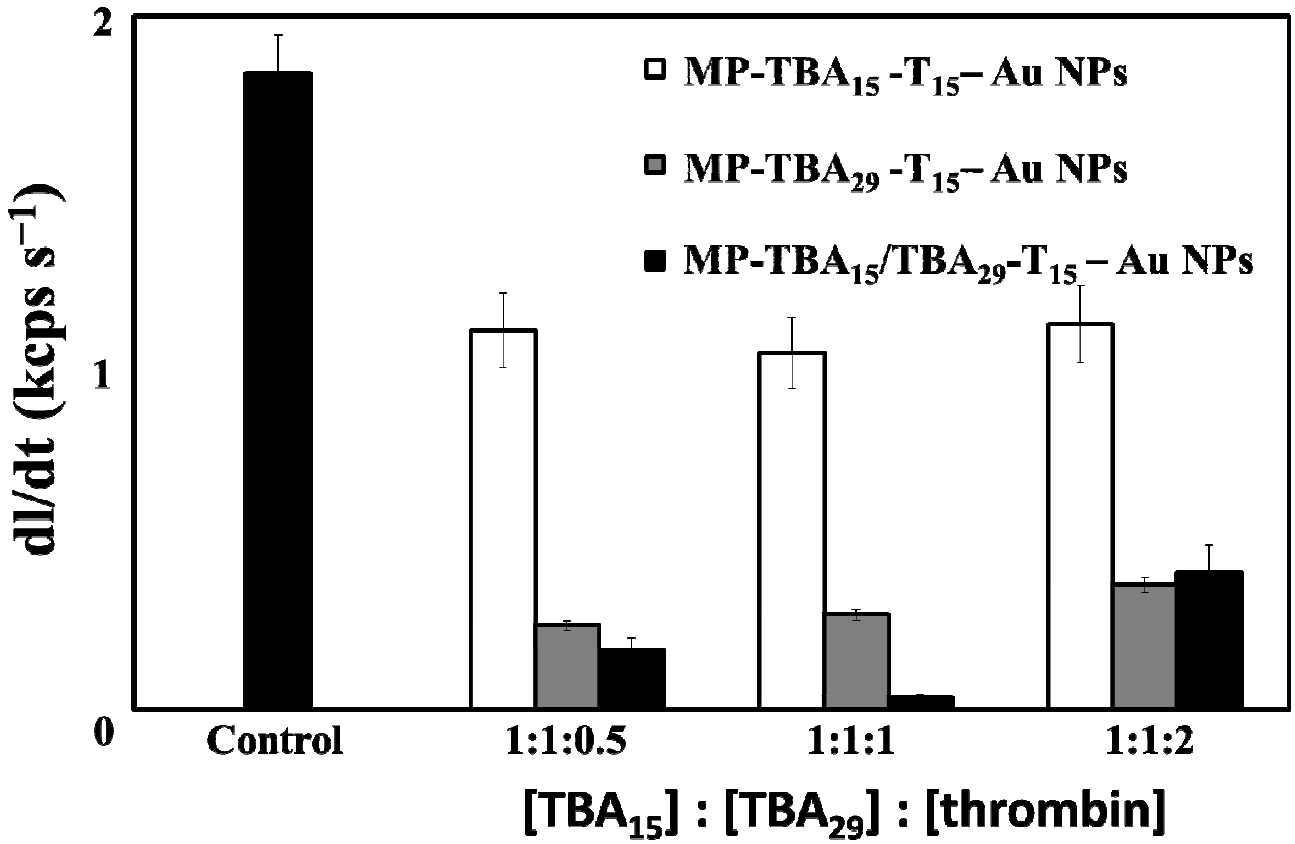

Figure S2. Initial reaction rate of the coagulation of mixtures of thrombin and fibrinogen containing various MP-TBA_{15}/TBA_{29}-T_{15}–Au NPs prepared under different ratios TBA_{15}:TBA_{29}:thrombin (1:1:0.5; 1:1:1; and 1:1:2). The light scattering of each sample was monitored at 750 nm. The error bars represent the standard deviation of three repeated measurements. Other conditions were the same as those described in Figure 1.

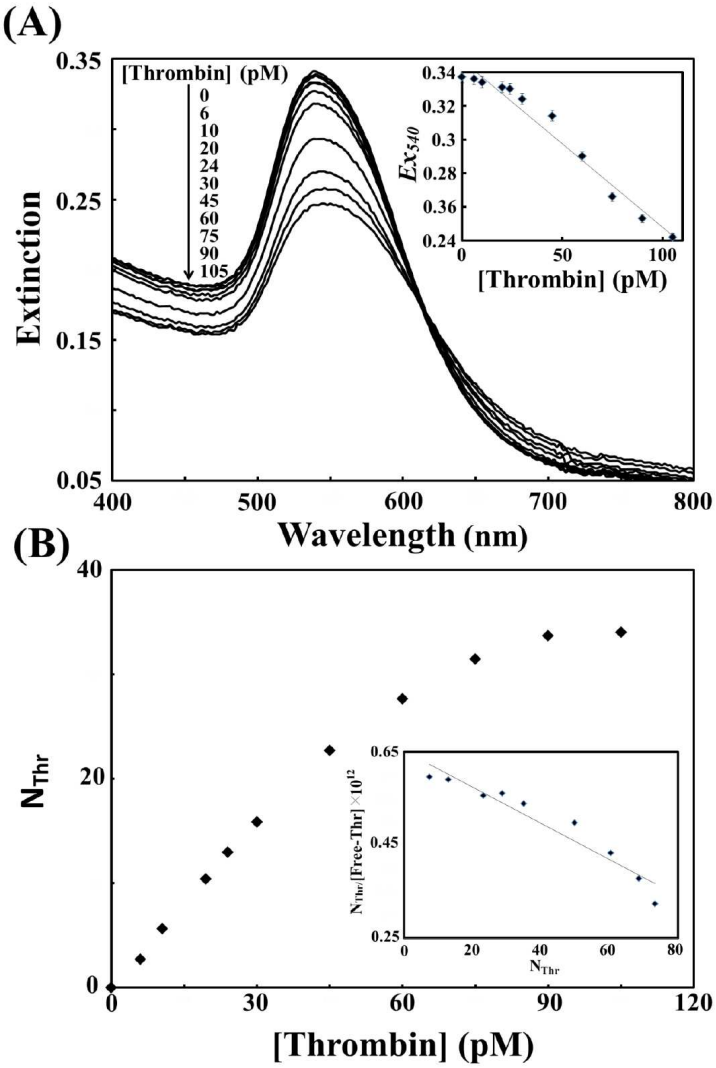

Figure S3. (A) UV/Vis absorption responses of Fib-Au NPs probe toward various concentrations of thrombin (0–105 pM). (B) Dissociation constant (K_d) of thrombin–MP-TBA$_{15}$/TBA$_{29}$-T$_{15}$–Au NPs complexes determined by the plot of N_{Thr}/[Free-Thr] = $N_{max}/K_d - N_{Thr}/K_d$. Inset to (A): Plot the liner relationship of Ex_{540} values of Fib-Au NPs vs the thrombin concentration (y = -0.001x + 0.3471; R^2 = 0.97). From the plot Scatchard equation, we determined the saturated binding of thrombin per MP-TBA$_{15}$/TBA$_{29}$-T$_{15}$–Au NP to be 32 (± 7) (n = 4). Error bars represent the standard deviations from four repeated experiments.

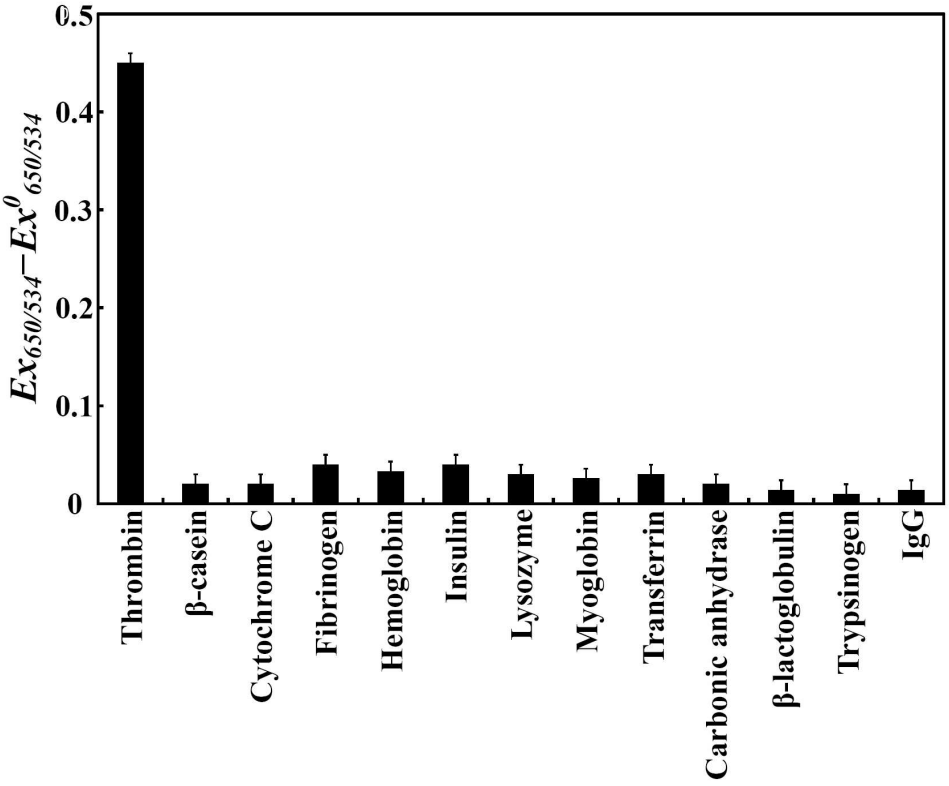

Figure S4. $Ex_{650/534}$ changes ($Ex_{650/534}$ − $Ex^{0}_{650/534}$) of MP-TBA$_{15}$-T$_{15}$–Au NPs/MP-TBA$_{29}$-T$_{15}$–Au NP probe (30 pM) toward thrombin (5 nM) and other proteins (500 nM each). Error bars represent standard deviations from four repeated experiments. $Ex^{0}_{650/534}$ and $Ex_{650/534}$ are the extinction ratio for the MP-TBA$_{15}$-T$_{15}$–Au NPs/MP-TBA$_{29}$-T$_{15}$–Au NP probe in the absence and presence of one of each protein, respectively. Other conditions are the same as those described in Figure 1.

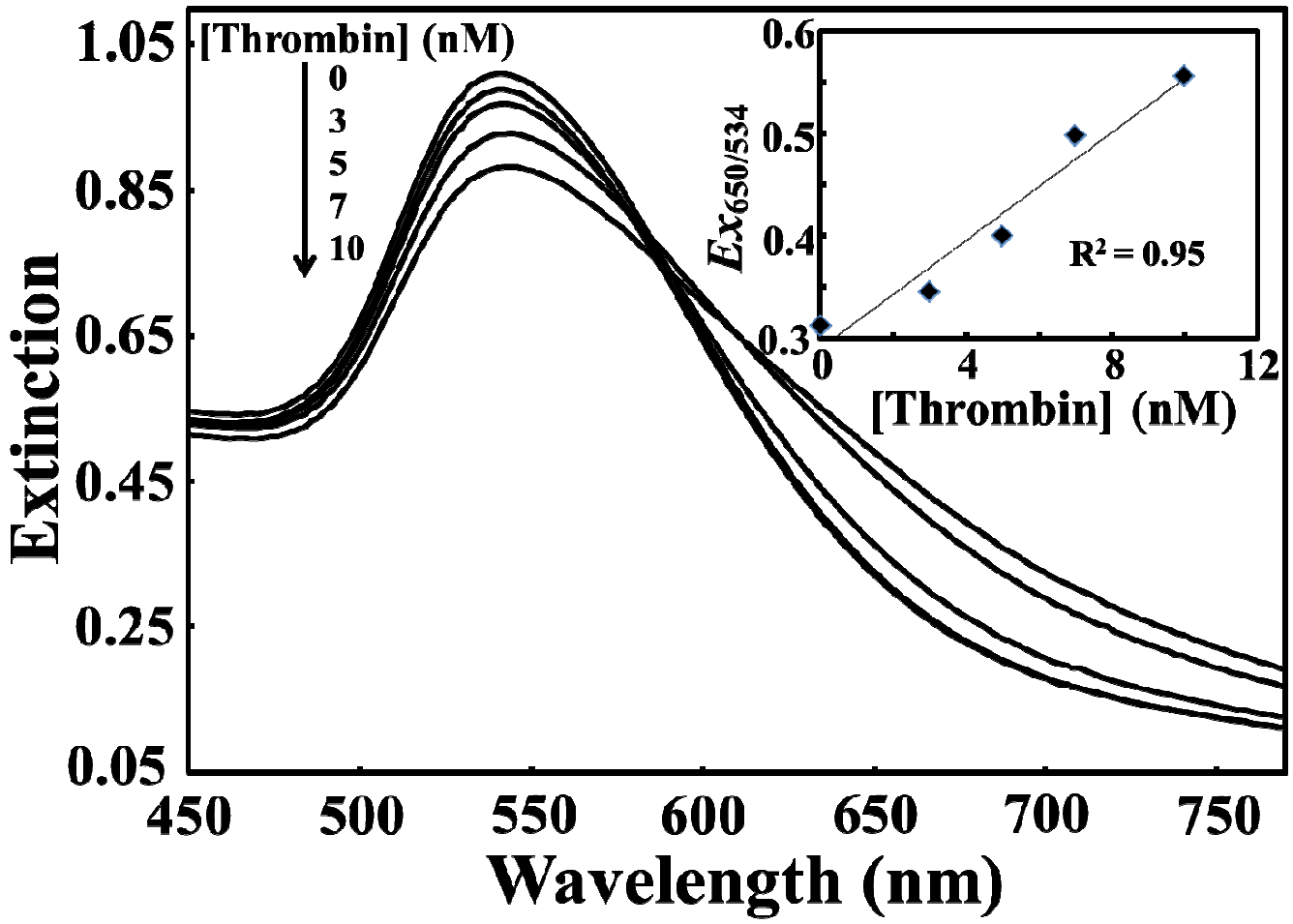

Figure S5. UV/Vis absorption spectra of MP-TBA$_{15}$-T$_{15}$–Au NPs and MP-TBA$_{29}$-T$_{15}$–Au NPs (32 nm, 30 pM) at various concentrations of thrombin (0–10 nM) spiked in 10-fold serum samples. Inset: linear plot of the $Ex_{650/534}$ against the thrombin concentration. Other conditions were the same as those described in Figure 1.