Electronic Supplementary Material (ESI) for Analyst.

Supporting Information

Label-free detection of fibrinogen based on fibrinogen-enhanced peroxidase activity of fibrinogen-hemincomposite

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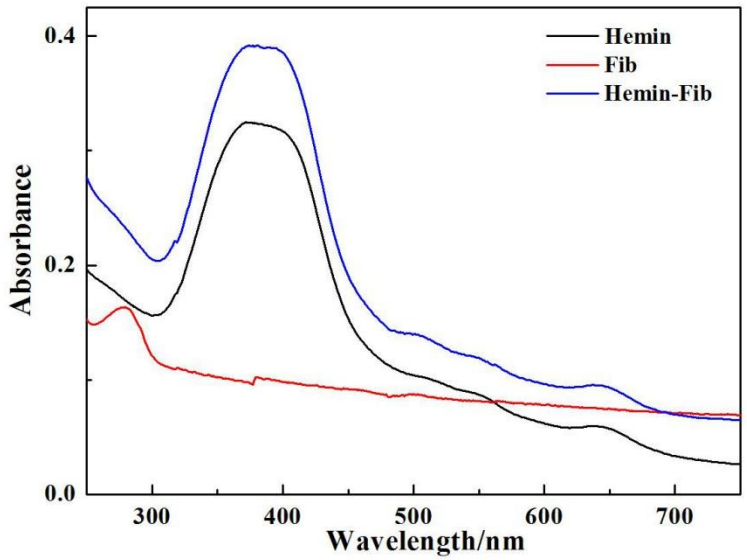

Fig. S1. UV–vis spectra of hemin (black), Fib (red) and the hemin-Fib (blue). Experimental conditions: hemin 25 μM, Fib 0.1 μM.

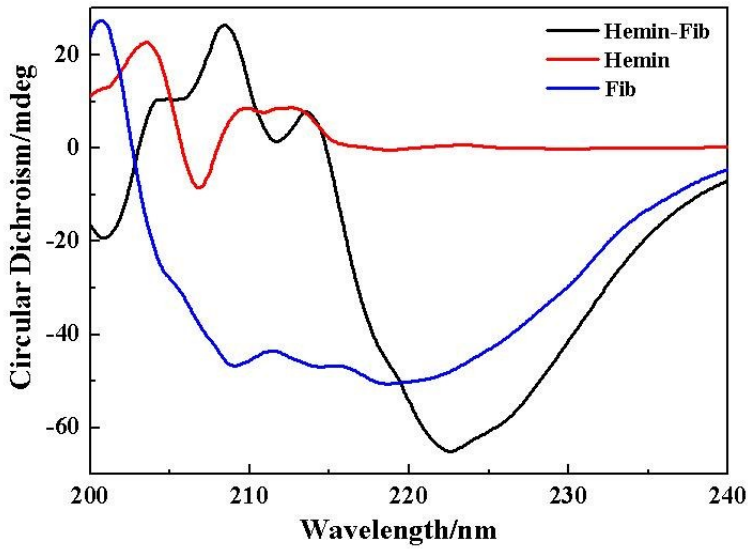

Fig. S2. CD spectra of hemin (red), Fib (blue) and the hemin-Fib (black). Experimental conditions: hemin 25 μM, Fib 0.1 μM.

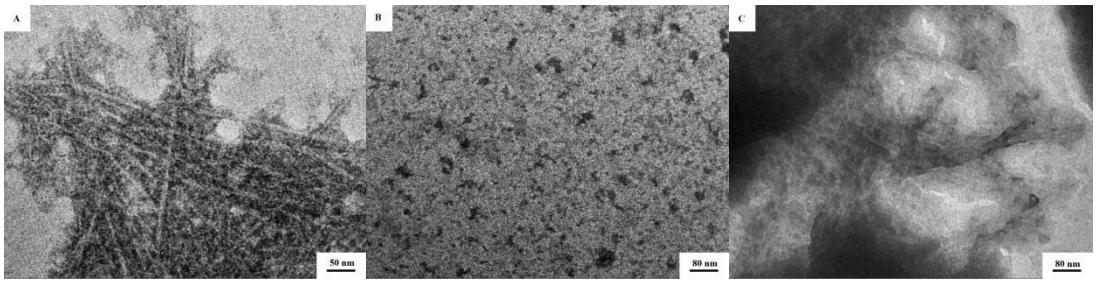

Fig. S3. TEM images of Fib (A), hemin (B), and hemin-Fib (C).

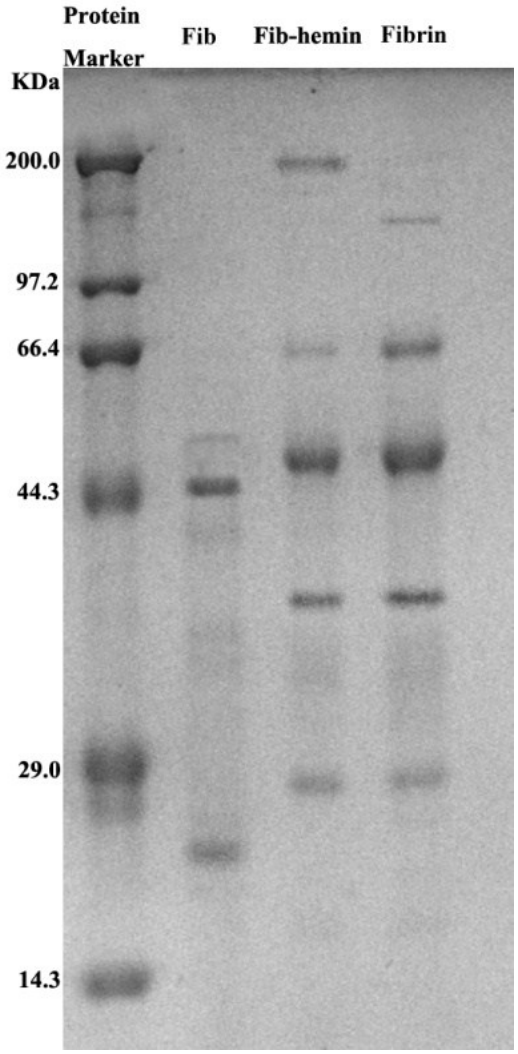

Fig. S4. SDS-polyacrylamide gel electrophoresis of Fib.

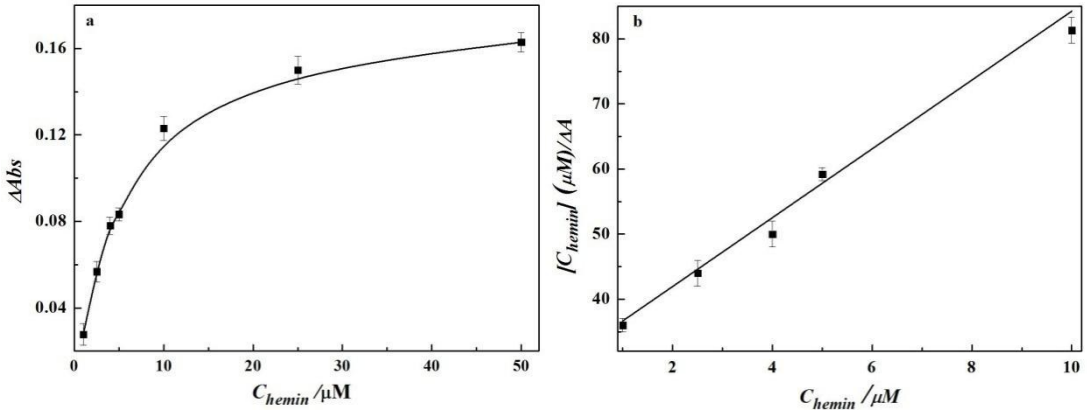

Fig. S5. Langmuir isotherms obtained from the Fib interactions with various concentrations of hemin at room temperature. (a) Non-linear regression between ΔA and [Hemin], (b) linear regression between [Hemin]/ΔA and [Hemin]. Experimental conditions: Fib 50nM, ABTS 5 mM, H_2O_2 2.5 mM, 20 mM Tris-HCl (pH 8.0).

$$\text{Hemin} + \text{Fib} \rightleftharpoons \text{Hemin·Fib} \qquad (1)$$

$$K_b = \frac{[\text{Hemin·Fib}]}{[\text{Hemin}][\text{Fib}]} \qquad (2)$$

$$\triangle A = \triangle A^{max} \frac{[\text{Hemin}]K_b}{1 + [\text{Hemin}]K_b} \qquad (3)$$

$$\frac{[\text{Hemin}]}{\triangle A} = \frac{1}{\triangle A^{max} K_b} + \frac{[\text{Hemin}]}{\triangle A^{max}} \qquad (4)$$

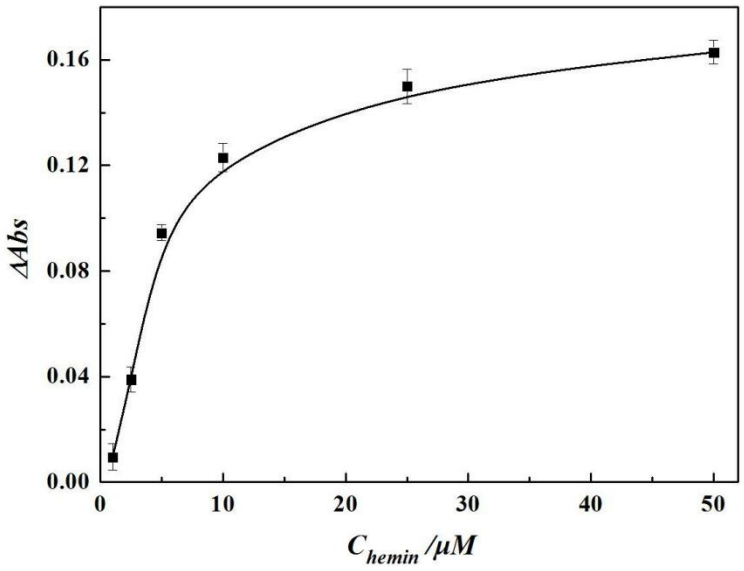

Fig. S6. The effect of catalytic activity on hemin. Experimental conditions: 100 μL of 5 mM ABTS, 100 μL of 2.5 mM H_2O_2, 100 μL of 20 mM Tris-HCl (pH 8.0), 7 min.

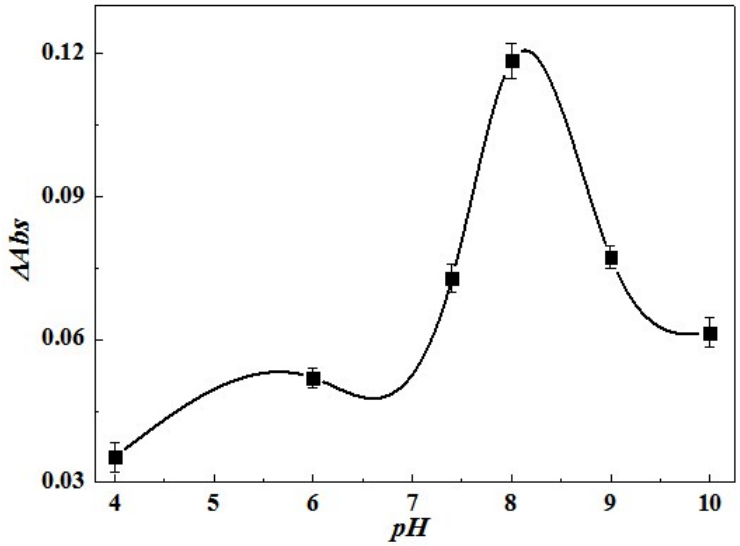

Fig. S7. The effect of catalytic activity on the interaction between hemin and Fib with difference pH. Experimental conditions: 100 μL of 5 mM ABTS, 100 μL of 2.5 mM H_2O_2, 100 μL of 20 mM Tris-HCl (pH 8.0), 50 μL of 25 μM hemin or hemin-Fib (Fib 50 nM, hemin 25 μM), 7 min.

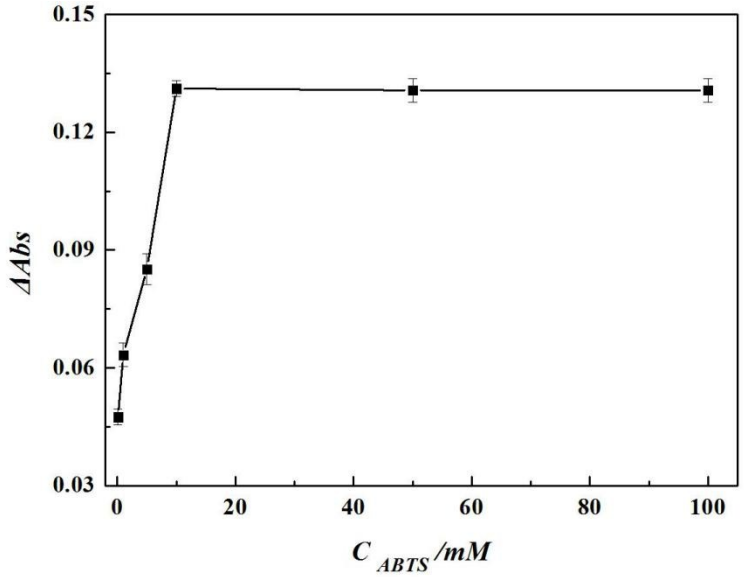

Fig. S8. The effect of catalytic activity on ABTS. Experimental conditions: 100 μL of 2.5 mM H_2O_2, 100 μL of 20 mM Tris-HCl (pH 8.0), 50 μL of 25 μM hemin or hemin-Fib (Fib 50 nM, hemin 25 μM), 7 min.

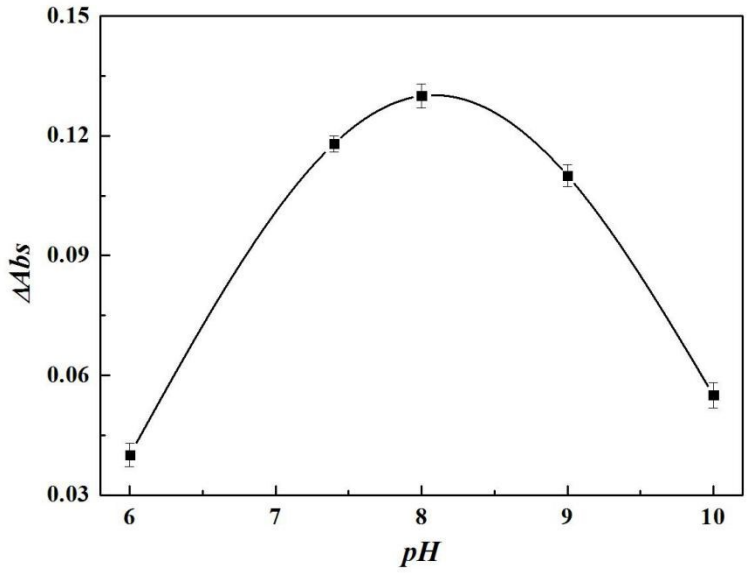

Fig. S9. The effect of catalytic activity on pH. Experimental conditions: 100 μL of 5 mM ABTS, 100 μL of 2.5 mM H_2O_2, 100 μL of 20 mM Tris-HCl, 50 μL of 25 μM hemin or hemin-Fib (Fib 50 nM, hemin 25 μM), 7 min.

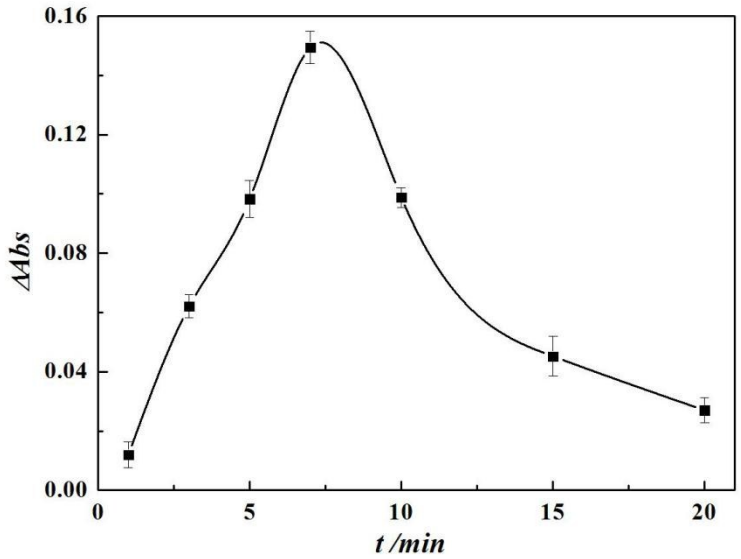

Fig. S10. The effect of catalytic activity on the reaction time of ABTS-H_2O_2 system. Experimental conditions: 100 μL of 5 mM ABTS, 100 μL of 2.5 mM H_2O_2, 100 μL of 20 mM Tris-HCl (pH 8.0), 50 μL of 25 μM hemin or hemin-Fib (Fib 50 nM, hemin 25 μM), 7 min.