Supplementary materials for

A simple and effective strategy for detecting artemisinin based on oxidative cyclization of vitamine B_1 elicit fluorescence turn-on

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Section 1. ***Determination of fluorescence quantum yield of thiochrome***

The fluorescence quantum yield (FQY) measurements were conducted using quinine sulfate (FQY=0.54 at 360 nm) in sulfuric acid (0.1 mol/ L, η =1.33) as the standard. The absolute quantum yield values were measured corresponding to the following equation: 1

$$\Phi_u=\Phi_s(I_u/I_s)(A_s/A_u)(\eta^2_u/\eta^2_s)$$

Φ is fluorescence quantum yield; I is the determined integrated fluorescence intensity; A is the optical density recorded at the excitation wavelength; η is the refractive index. The subscript "s" refers to the standard fluorescence quantum yield of reference quinine sulfate. The subscript "u" refers to the unknown quantum yield of product thiochrome of VB1. Absorbance in the 1 cm fluorescence cuvette were kept under 0.1 at the excitation wavelength of 360 nm to minimize re-absorption effects.

Section 2. ***Optimization of the VB1-based probe for ART detection***

To achieve a better response of VB1 to a-ART, we optimized the conditions which can affect the detection of a-ART, such as the ratio of VB1 to a-ART, the pH

value, reaction time and reaction temperature. The pH may affect on the charge of VB1, a-ART and the binding of VB1 to a-ART, therefore we studied the effect of pH value from 3.0 to 11.0 on the flourescence. The fluorescence intensity of the products of VB1 indicated only a slight shift as the pH value changed in the rang of 7.5-11.0(Fig.1Sa). Upon common plant, the pH value in the microenvironmental in cell may vary from 4.5 to approximately 7.5. Therefore, the pH 7.5 was taken to test the response of the nanoprobe based on the comprehensive consideration. As can be seen from Fig. S1a, the reaction of VB1 with a-ART was completed within 5 min. The optimal experimental condition was obtained when the pH of sample solution was 7.5, reaction time was 5 min and concentration of VB1 was ～460 μM at room temperature.

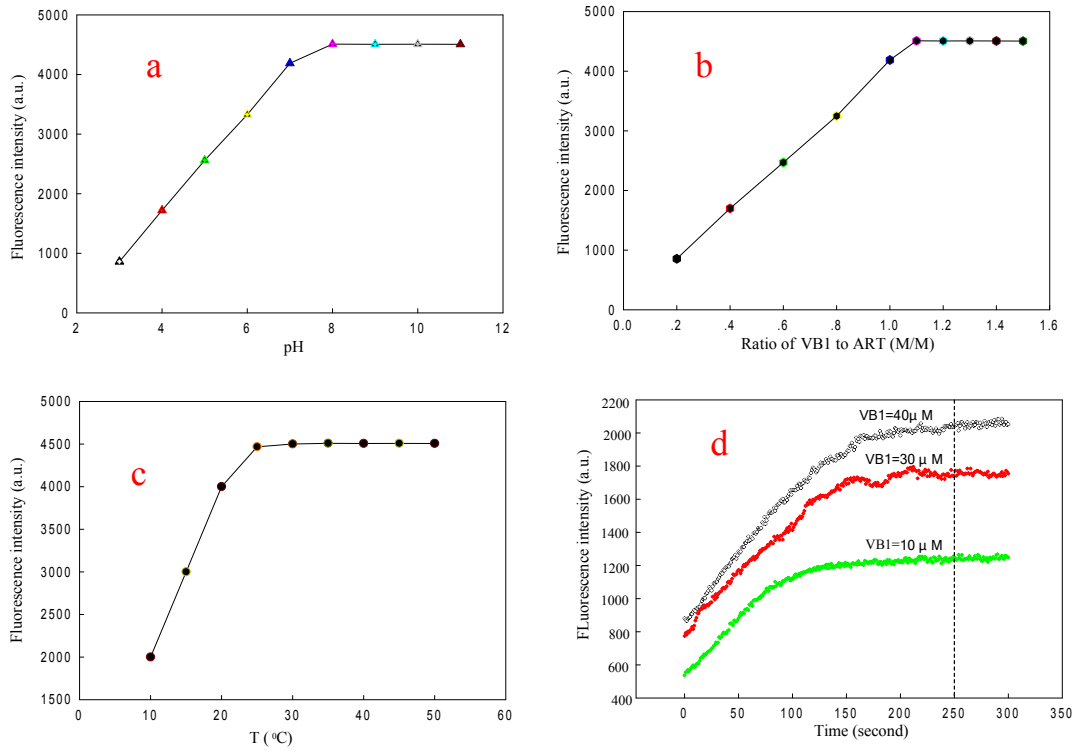

Fig.S1 (a) Fluorescence response of VB1 at different pH values; (b) Fluorescence response of a-ART-VB1 sensing

system at different ratio of VB1 to a-ART; (c) Reaction temperature for the reaction of VB1 with a-ART; (d)Reaction time for the reaction of VB1 with a-ART.