

# **Development of an Immunosensor for *Pf*HRP 2 as a Biomarker for Malaria Detection**

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**Table S1:** Overview of cyclic voltammetric analyses of the three electrodes, JD1, JD2a and JD2b at 20 mV s<sup>-1</sup>, using 1 mM potassium ferricyanide solution in 0.1 M KCl, n= 5.

|                                                     | JD1           | JD2a          | JD2b          |
|-----------------------------------------------------|---------------|---------------|---------------|
| <b>I<sub>PA</sub> (μA)</b> <sup>a</sup>             | 19.88 ± 0.18  | 14.41 ± 0.32  | 13.70 ± 1.12  |
| <b>E<sub>PA</sub> (V)</b> <sup>b</sup>              | 0.09 ± 0.01   | 0.004 ± 0.001 | -0.03 ± 0.01  |
| <b>I<sub>PC</sub> (μA)</b>                          | -24.99 ± 0.02 | -17.43 ± 0.01 | -18.93 ± 0.67 |
| <b>E<sub>PC</sub> (v)</b>                           | -0.079 ± 0.11 | -0.13 ± 0.01  | -0.20 ± 0.02  |
| <b>ΔE (V)</b> <sup>c</sup>                          | 0.17          | 0.13          | 0.17          |
| <b>I<sub>PA</sub> / I<sub>PC</sub></b> <sup>d</sup> | -1.14         | -0.83         | -0.72         |
| <b>A<sub>active</sub></b>                           | 0.18          | 0.15          | 0.16          |
| <b>A<sub>active</sub> (%)</b> <sup>e</sup>          | 78.9          | 66.8          | 69.6          |

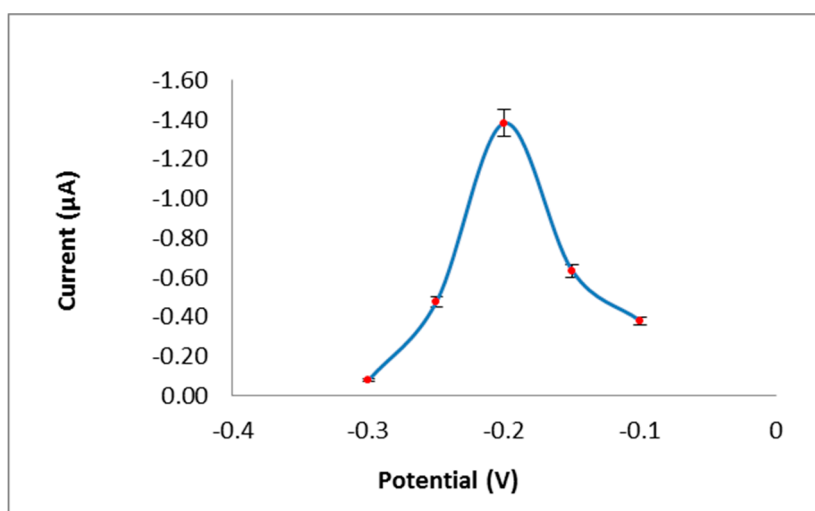
<sup>a</sup> I<sub>P C/A</sub> = Cathodic / anodic peak current

<sup>b</sup> E<sub>P C/A</sub> = Potential applied at the cathodic / anodic peak

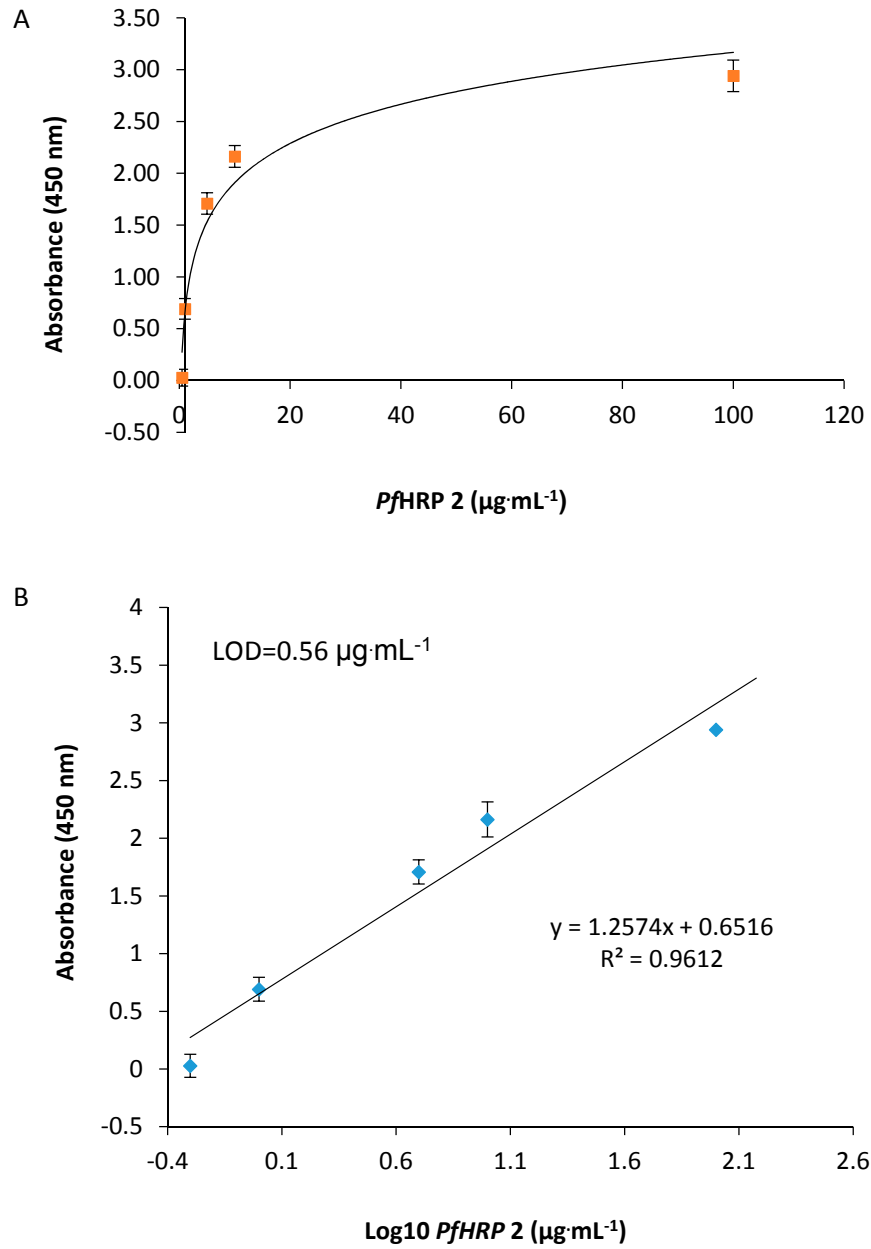
<sup>c</sup> Peak distance ΔE = E<sub>PA</sub> – E<sub>PC</sub>

<sup>d</sup> Ratio between the cathodic and anodic peak current

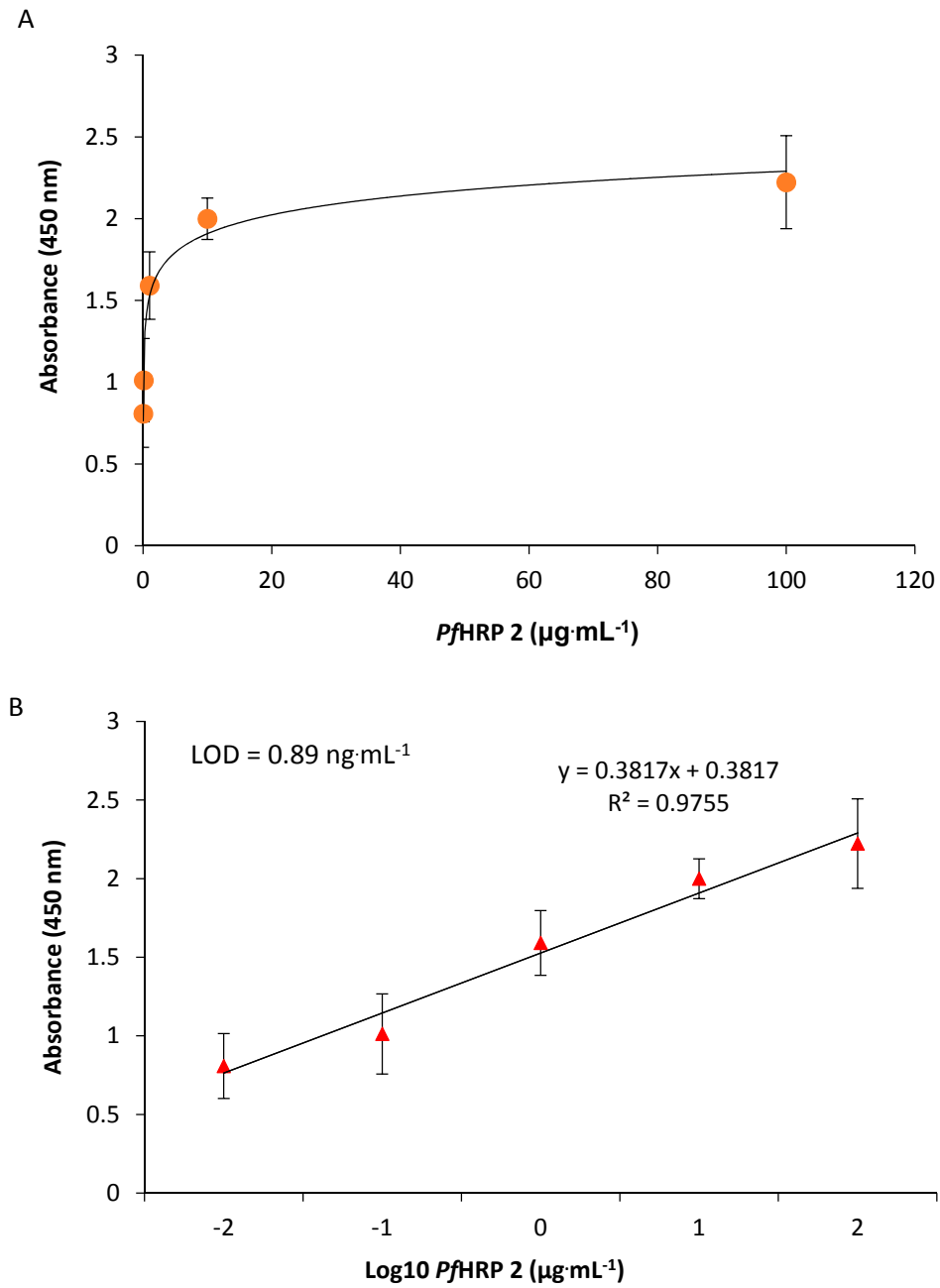
<sup>e</sup> Ratio between the active area calculated by the Randles – Sevcik equation and the geometric surface.



**Fig. S1.** Optimum potential determination by step potential of TMB / H<sub>2</sub>O<sub>2</sub> system with antibody-HRP on JD2 electrodes. The results shown are after subtracting the signal with no enzyme.



**Fig. S2.** (a) Standard curve of absorbance versus antigen concentration in a direct ELISA assay, (b) linear regression with correlation coefficient and  $R^2$  value of 0.9612, limit of detection is 0.56  $\mu\text{g}\cdot\text{mL}^{-1}$ .



**Fig. S3.** (a) Standard curve of absorbance versus antigen concentration in a Sandwich ELISA assay, (b) linear regression with correlation coefficient and  $R^2$  value of 0.9755. Limit of detection is 0.89  $\mu\text{g mL}^{-1}$ .