

*Supporting Information*

# Photoelectrochemical Determination of Cardiac Troponin I as a Biomarker of Myocardial Infarction Using a $\text{Bi}_2\text{S}_3$ Film Electrodeposited on a $\text{BiVO}_4$ -Coated, Fluorine-Doped Tin Oxide Electrode

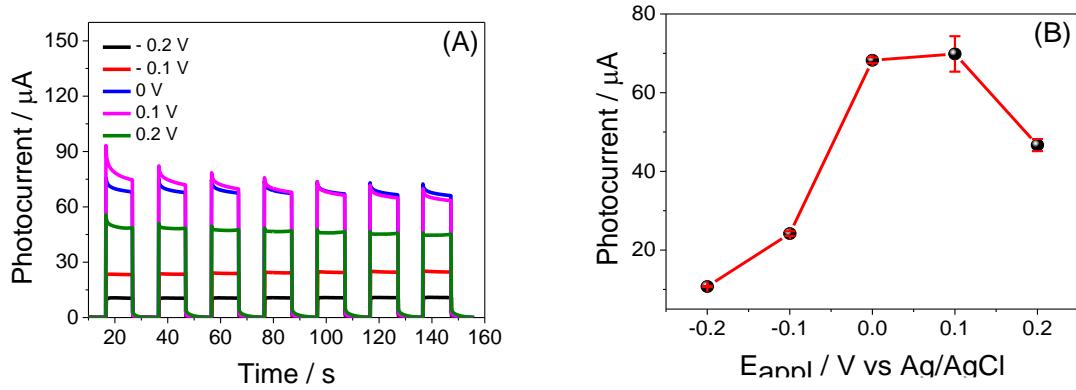
Thatyara Oliveira Monteiro <sup>1</sup>, Antônio Gomes dos Santos Neto <sup>2</sup>, Alan Silva de Menezes <sup>3</sup>, Flávio Santos Damos <sup>2</sup>, Rita de Cássia Silva Luz <sup>2,\*</sup> and Orlando Fatibello-Filho <sup>1,\*</sup>

<sup>1</sup> Department of Chemistry, Federal University of São Carlos, 13565-905 São Carlos, SP, Brazil

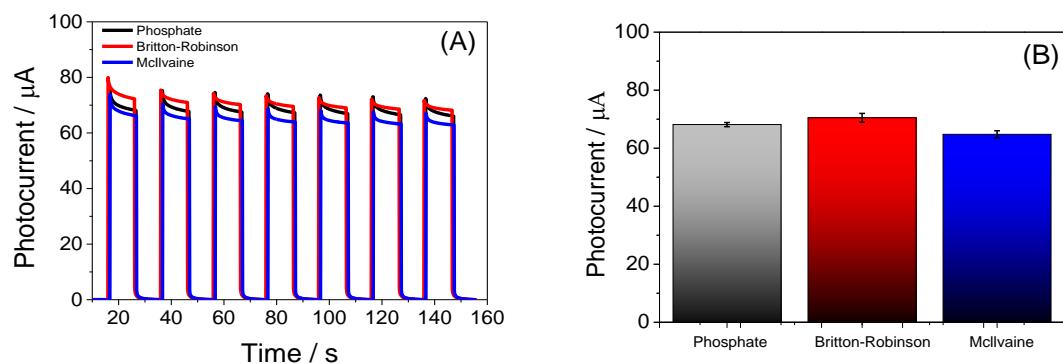
<sup>2</sup> Department of Chemistry, Federal University of Maranhão, 65080-805 São Luís, MA, Brazil

<sup>3</sup> Department of Physics, Federal University of Maranhão, 65080-805, São Luís, MA, Brazil

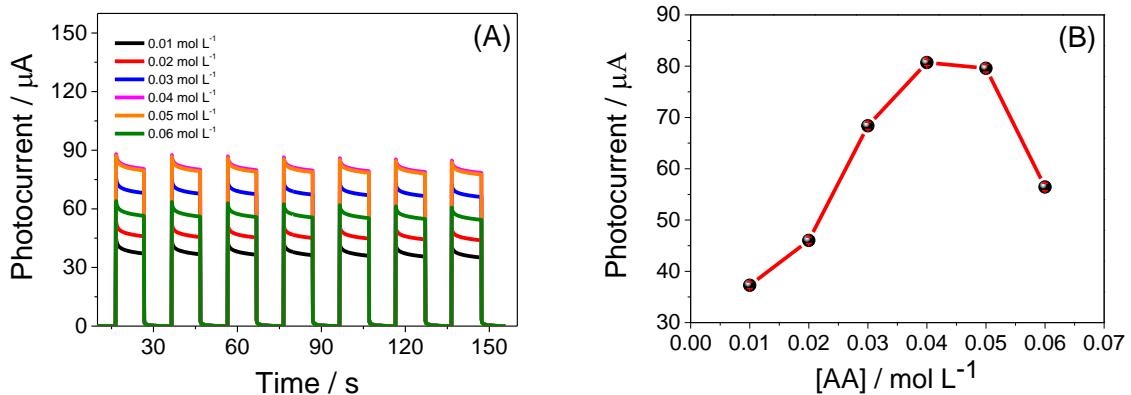
\* Correspondence: rita.luz@ufma.br (R.C.S.L.); bello@ufscar.br (O.F.F.)



**Figure S1.** (A) Photoelectrochemical response of the  $\text{Bi}_2\text{S}_3/\text{BiVO}_4/\text{FTO}$  platform obtained at different potentials. Amperometric measurements performed in  $0.1 \text{ mol L}^{-1}$  phosphate buffer (pH 7.4) containing  $0.03 \text{ mol L}^{-1}$  AA. (B) Plot of photocurrent vs  $E_{\text{appl}}$ . Data obtained from the Figure S1A.

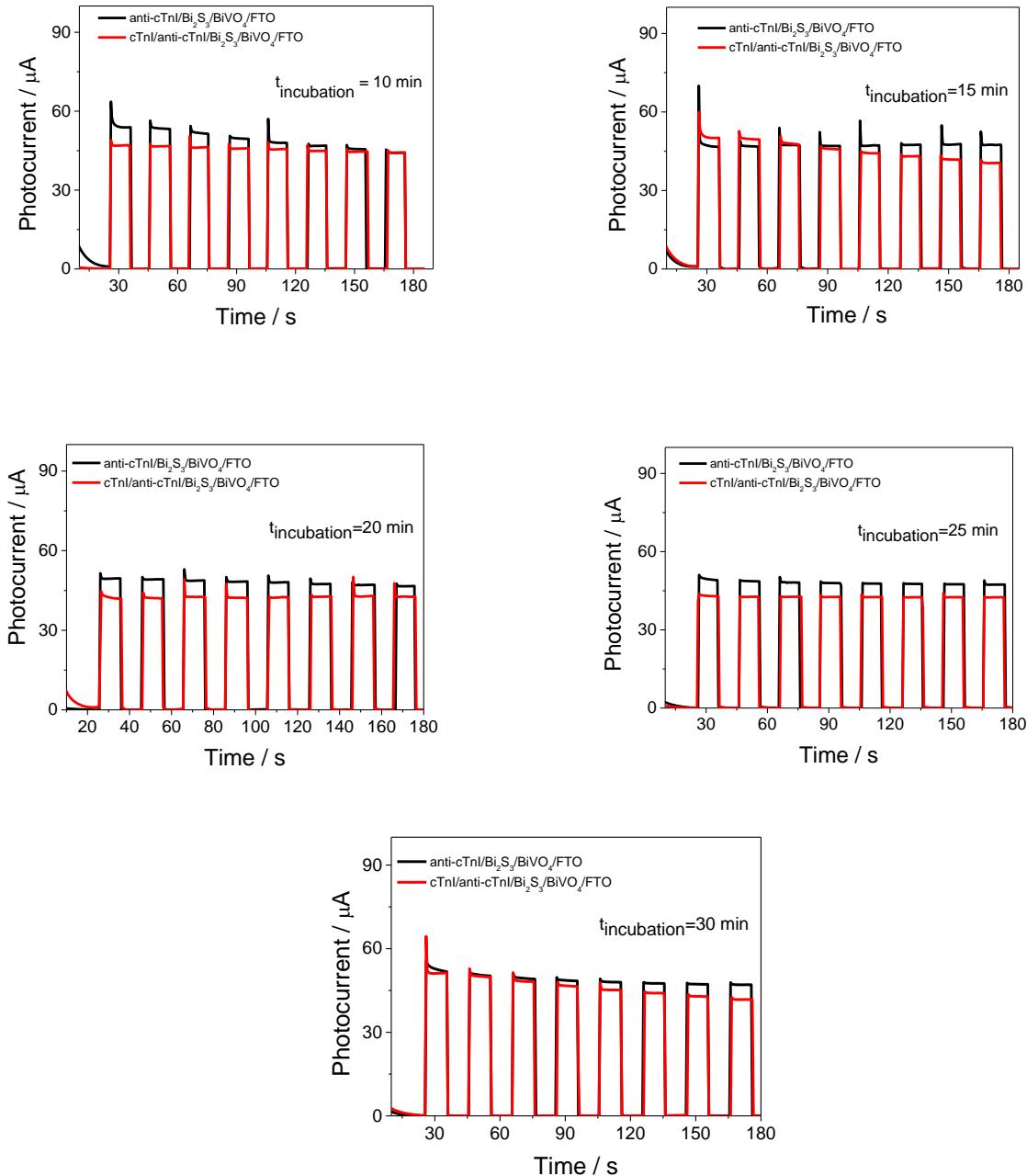


**Figure S2.** (A) Photoelectrochemical response of the  $\text{Bi}_2\text{S}_3/\text{BiVO}_4/\text{FTO}$  platform obtained at different buffer solutions. (B) Plot of photocurrent vs. different buffer solutions. Amperometric measurements performed in  $0.1 \text{ mol L}^{-1}$  of buffer (pH 7.4) containing  $0.03 \text{ mol L}^{-1}$  AA.  $E_{\text{appl}} = 0 \text{ V}$  vs.  $\text{Ag}/\text{AgCl}/\text{KCl}_{\text{sat}}$ .



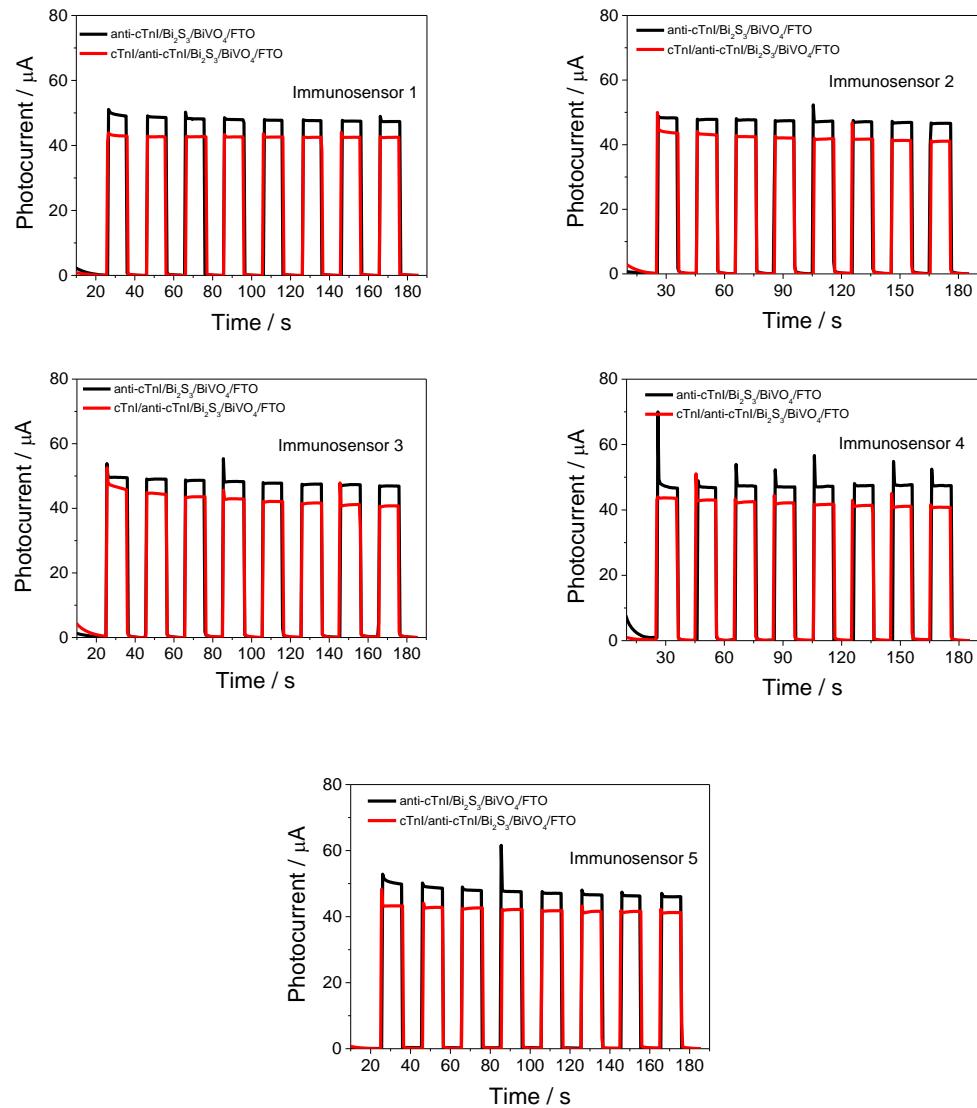
**Figure S3.** (A) Photoelectrochemical response of the  $\text{Bi}_2\text{S}_3/\text{BiVO}_4/\text{FTO}$  platform obtained at different AA concentrations ( $0.01\text{--}0.06 \text{ mol L}^{-1}$ ). (B) Amperometric measurements performed in  $0.1 \text{ mol L}^{-1}$  phosphate buffer (pH 7.4) containing  $0.04 \text{ mol L}^{-1}$  AA.  $E_{\text{appl}} = 0 \text{ V}$  vs.  $\text{Ag}/\text{AgCl}/\text{KCl}_{\text{sat}}$ .

### Data of Figure 3 C



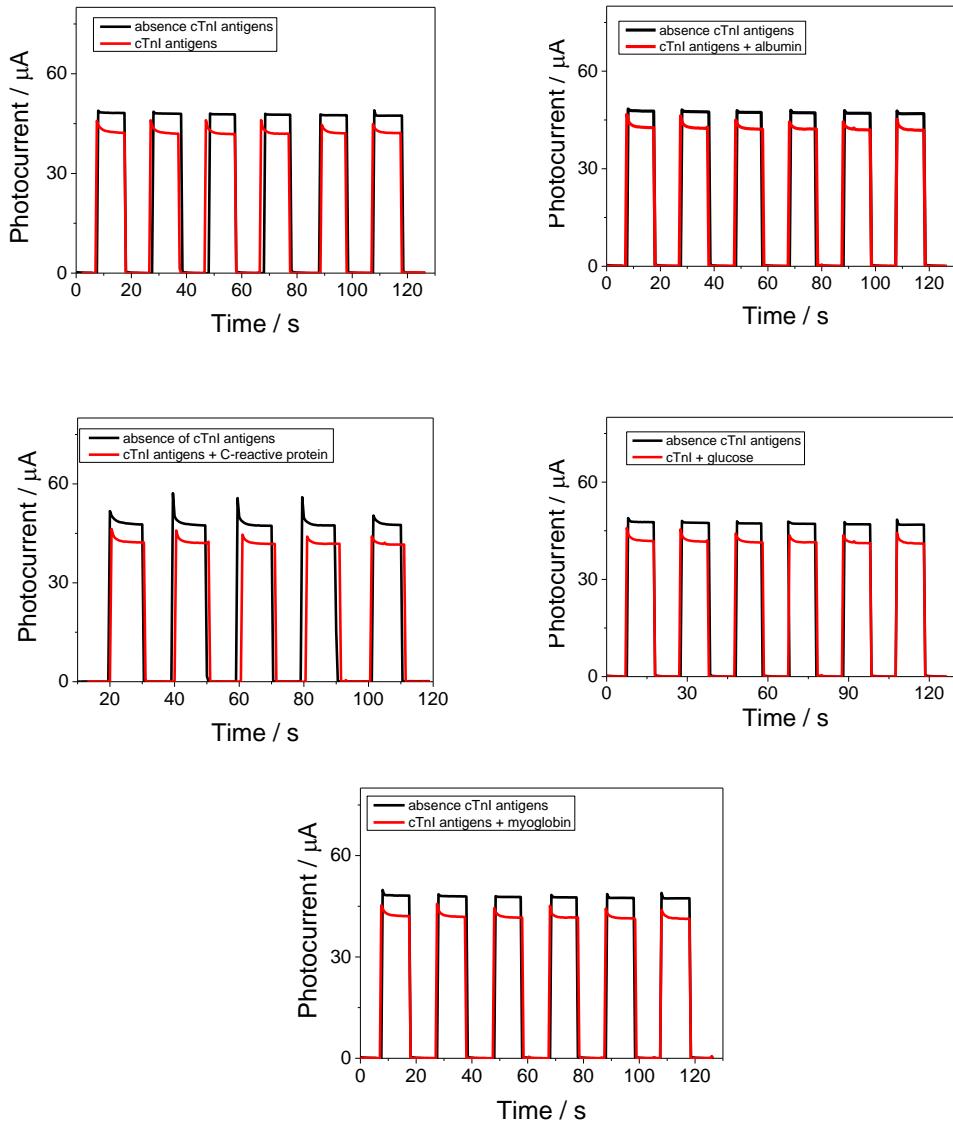
**Figure S4.** Photoelectrochemical responses of the anti-cTnI/ $\text{Bi}_2\text{S}_3/\text{BiVO}_4/\text{FTO}$  PEC immunosensor before (black amperogram) and after incubation with cTnI antigens (red amperograms) at different incubation times. The measurements were performed in  $0.1 \text{ mol L}^{-1}$  phosphate buffer, pH 7.4, containing  $0.04 \text{ mol L}^{-1}$  AA.  $E_{\text{appl}} = 0 \text{ V}$  vs. Ag/AgCl/KCl<sub>sat</sub>. [anti-cTnI] =  $5 \text{ }\mu\text{g mL}^{-1}$ ; [cTnI] =  $1 \text{ ng mL}^{-1}$ .

### Reproducibility (Data of Figure 5B)



**Figure S5.** Photoelectrochemical responses obtained with 5 (five) different anti-cTnI/ $\text{Bi}_2\text{S}_3/\text{BiVO}_4/\text{FTO}$  PEC immunosensors under optimized conditions before (black amperograms) and after (red amperograms) incubation with cTnI.  $[\text{cTnI}] = 1 \text{ ng mL}^{-1}$ ,  $t_{\text{incubation}} = 25 \text{ min}$ .

### Data of Figure 5C



**Figure S6.** Photoelectrochemical responses obtained with the anti-cTnI/ $\text{Bi}_2\text{S}_3/\text{BiVO}_4/\text{FTO}$  PEC immunosensor under optimized conditions before (black amperogram) and after (red amperogram) incubation with cTnI ( $1 \text{ ng mL}^{-1}$ ) in absence and presence of different species (albumin, C-reactive protein, glucose, and myoglobin). [Foreign specie] =  $100 \text{ ng mL}^{-1}$ ;  $t_{\text{incubation}} = 25 \text{ min}$ .