

Supporting Information for

**A high-performance self-supporting electrochemical biosensor to detect aflatoxin B1**

Yunfei Zhang,<sup>1+</sup> Tingting Lin,<sup>1+</sup> Yi Shen,<sup>\*1,2,3</sup> and Hongying Li<sup>4</sup>

<sup>1</sup>School of Food Science and Engineering, South China University of Technology, Guangzhou, 510640, China.

<sup>2</sup>Overseas Expertise Introduction Center for Discipline Innovation of Food Nutrition and Human Health (111 Center) Guangzhou, 510640, China.

<sup>3</sup>China-Singapore International Joint Research Institute, Guangzhou Knowledge City, Guangzhou 510663, China.

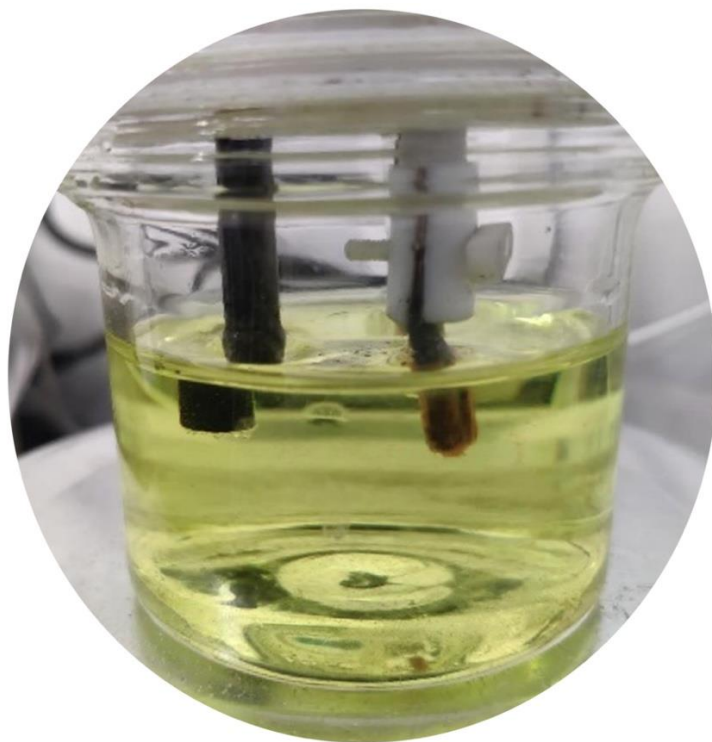
<sup>4</sup> Institute of High-Performance Computing, Agency for Science, Technology and Research, 138632, Singapore.

\*Correspondence: Yi Shen (feyshen@scut.edu.cn)

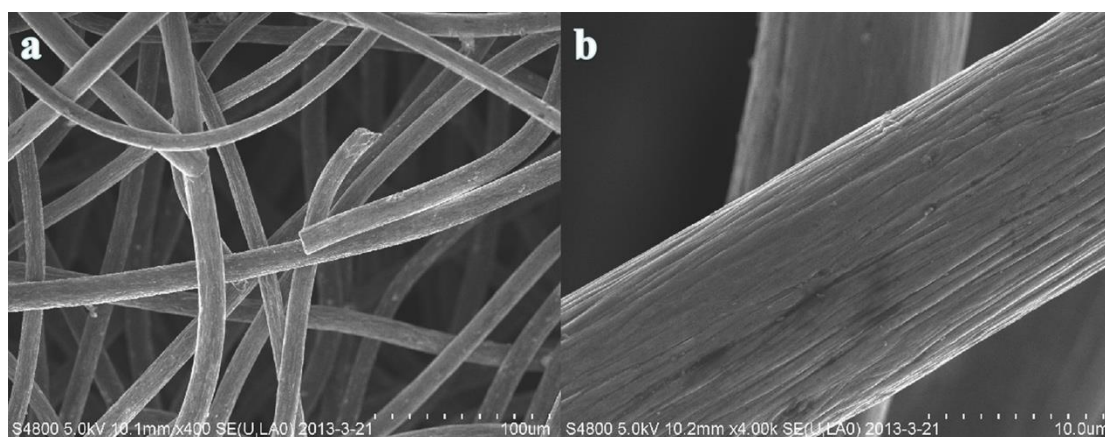
<sup>+</sup> The authors contributed equally to this work.

## **Reagents**

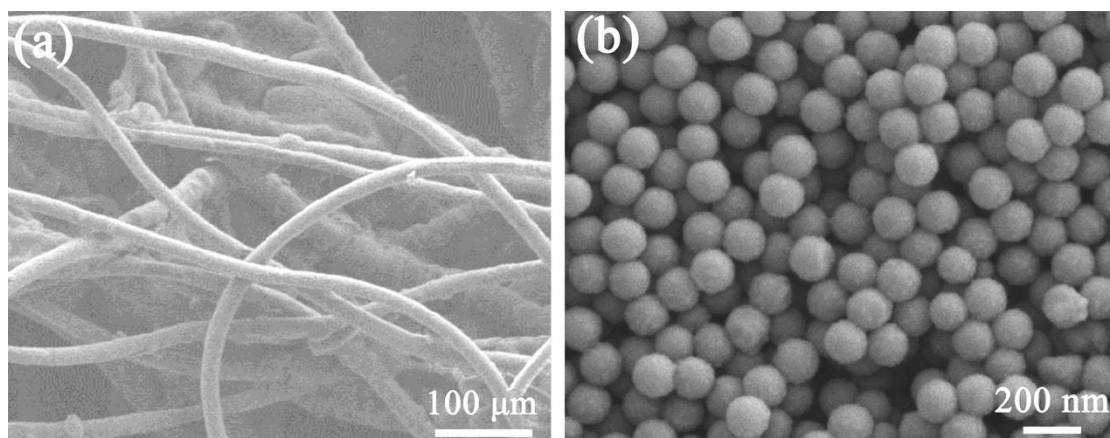
1-Hydroxy-2,5-pyrrolidinedione (NHS), 4-(2-hydroxyethyl)-1-piperazineethanesulfonic acid (HEPES) and N-Ethyl-N'-(3-dimethylaminopropyl) carbodiimide hydrochloride (EDC) were purchased from the Sigma-Aldrich, China. Ochratoxin A (OTA, 10  $\mu\text{g mL}^{-1}$  in acetonitrile) was purchased from the Pribolab Bioengineering Co., Ltd. AFB<sub>1</sub> ( $\geq 98.0\%$ ), bovine serum albumin (BSA, 20  $\text{mg mL}^{-1}$ ) and horseradish peroxidase (HRP, activity  $\geq 250 \text{ U mg}^{-1}$ ) were obtained from the Sangon Biotech (Shanghai, China). Potassium ferricyanide ( $\text{K}_3[\text{Fe}(\text{CN})_6]$ ), oxalic acid, nickel (II) nitrate hexahydrate, magnesium chloride ( $\text{MgCl}_2$ ), copper (II) nitrate trihydrate, glucose (G), citric acid (CA), starch, ascorbic acid (AA), potassium chloride (KCl), sodium chloride (NaCl), Chloroauric acid ( $\text{HAuCl}_4$ ), Sodium hydroxide (NaOH), disodium phosphate ( $\text{Na}_2\text{HPO}_4$ ), methanol, potassium dihydrogen phosphate ( $\text{KH}_2\text{PO}_4$ ) and  $\text{H}_2\text{O}_2$  with a mass concentration of 30% were purchased from the Congyuan Instrument Co., Ltd. (Guangzhou, China). Sulfhydryl- and amino- modified Apt of AFB<sub>1</sub> with a sequence of (5'-SH modified) 5'-TGG GGT TTT GGT GGC GGG TGG TGT ACG GGC GAG GG-3' (3'-NH<sub>2</sub> modified) were obtained from the Aiji Biotechnology Co., Ltd. (Guangzhou, China). All reagents were used as received without further purification. 0.01 M phosphate buffer (PBS) consists of 8 g of NaCl, 0.2 g of KCl, 1.44 g of  $\text{Na}_2\text{HPO}_4$  and 0.24 g of  $\text{KH}_2\text{PO}_4$  in an aqueous solution and the pH was adjusted to 7.4 by adding NaOH.



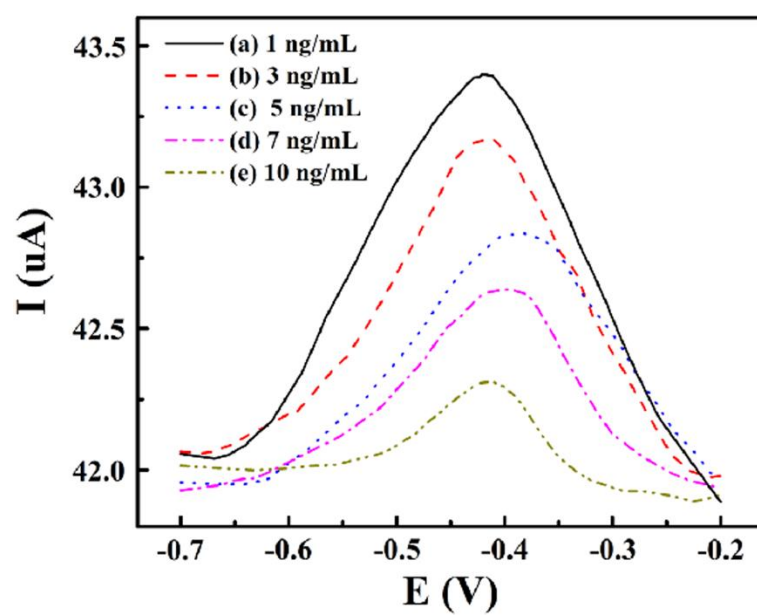
**Figure S1.** The picture of the as-prepared BSA-Apt-Au/SSE electrode.



**Figure S2.** FESEM micrographs of the pristine CF in different scales (a) 100  $\mu\text{m}$ , (b) 10  $\mu\text{m}$ .



**Figure S3.** FESEM micrographs of (a) SSE and (b) PS-COOH.



**Figure S4.** DPV responses of the biosensor recorded in 10 mM H<sub>2</sub>O<sub>2</sub> with varying concentrations of AFB<sub>1</sub>.