\( \alpha-\text{Fe}_2\text{O}_3 \) Nanorod Arrays for Bioanalytical Applications:
Nitrite and Hydrogen peroxide Detection

Fig. S1 XRD pattern of the electrodeposited film before calcination.

Fig. S2 Cyclic voltammogram of bare Fe electrode in 0.1 M PBS with 0.2 mM \( \text{NO}_2^- \). Scan rate: 50 mv/s.

Fig. S3 Cyclic voltammogram of bare Fe electrode in 0.1 M PBS with 0.2 mM \( \text{H}_2\text{O}_2 \). Scan rate: 50 mv/s.
Fig. S4 (A) XRD patterns of $\alpha$-$\text{Fe}_2\text{O}_3$ nanorod: fresh (black) and after 20 days (red), and their corresponding electrochemical impedance spectras (B).

Fig. S5 Typical SEM image of $\alpha$-$\text{Fe}_2\text{O}_3$ nanorod array after 20-days test.

Fig. S6 Determination of roughness factor of $\alpha$-$\text{Fe}_2\text{O}_3$ electrodes. (A) Cyclic voltammograms of $\alpha$-$\text{Fe}_2\text{O}_3$ NR arrays electrode as a function of the scan rate (along the arrow direction: 12, 10, 8, 6, 4 and 2 mV/s). (B) Dependence of the capacitive current on the scan rate (▲$\alpha$-$\text{Fe}_2\text{O}_3$ NR arrays, ■$\alpha$-$\text{Fe}_2\text{O}_3$ nanorod powder). The $\alpha$-$\text{Fe}_2\text{O}_3$ nanorod powder were synthesized based on a method reported in our previous work[1]. The $\alpha$-$\text{Fe}_2\text{O}_3$ nanorods are about 400 nm in length and typically 10 nm in diameter.
Fig. S7 Variation of the length of and roughness factor with respect to the different durations of the depositions.

Fig. S8 Comparison of the cyclic voltammograms of α-Fe₂O₃ NR arrays (Fe₂O₃-A), and α-Fe₂O₃ nanorod powder (Fe₂O₃-P) with the same amount of α-Fe₂O₃ per square centimeter to the addition of 0.1 mM NO₂⁻ and 0.1 mM H₂O₂, respectively.

Reference: