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Corrigendum

Corrigendum to "Parveen Kumar, Vinay Narwal, Ranjana Jaiwal, C.S. Pundir, Construction and application of amperometric sarcosine biosensor based on SOxNPs/AuE for determination of prostate cancer" [Biosens. Bioelectron. 122 (2018) 144–146]

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1. The author's regret that Fig. 2 has been replaced, as accidentally uploaded incorrectly during original file submission. Moreover, the authors also feel sorry as they forgot to cite the Fig. 3c during the original submission of manuscript.

2. In the present paper few texts overlap with our previous publication, so we have re-written few paragraphs to remove the overlapping in the text.

Para **3.2.2 By EIS**

Re-written text

Fig. 3e provides the electrochemical impedance spectra (EIS) of bare Au electrode and SOxNPs modified Au electrode in 5 mM $K_3Fe(CN)_6$/$K_4Fe(CN)_6$. The electron transfer resistance (R_{CT}) as calculated from Nyquist plot (Fig. 3e) was found to be higher for SOxNPs/Au electrode (150 Ω) than bare Au electrode (100 Ω). The higher R_{CT} value of modified Au electrode could be due to immobilization of SOxNPs onto Au electrode, as enzyme nanoparticles (aggregated protein molecules, in solution) are known as poor electron conductors and cause resistance to electron flow i.e. current. These results confirm the immobilization of SOxNPs onto Au electrode.

3.3 Construction and optimization of sarcosine biosensor Line 2–14

Re-written text

The biosensor showed optimum activity i.e. maximum current response within 2 s at 1.0 V, at a scan rate of 20 V/s, when incubated at pH6.5 in 0.1 M sodium phosphate buffer (Fig. 4a) and 35 °C (Fig. 4b). This response time of the present biosensor is lower than earlier sarcosine biosensors (Ozkutuk et al., 2016, 120 s) but equal to our earlier report (Narwal and Pundir, 2018), due to application of enzyme nanoparticles of SOx. The optimum pH of present biosensor is not only near to physiological pH but comparable to earlier reported sarcosine biosensors also (Robelo et al., 2014, pH7.2), (Herger et al., 2015, pH7.0) (Narwal et al., 2018, pH7.0). Similarly optimum temperature of present biosensor is close to physiological temperature and near/equal to that of previously reported sarcosine biosensors (Robelo et al., 2014, 37 °C), (Herger et al., 2015, 37 °C) (Narwal et al., 2018, 35 °C). Under optimal assay conditions, the biosensor had a linear relationship between current response in mA and sarcosine concentration ranging from 0.10 μM to100 μM, after which it was constant (Fig. 4c) (Table 4).

3.4 Evaluation of biosensor

Re-written text

The linearity of the present biosensor was 0.10 μM to100 μM, which is better than that of earlier reported biosensors (Rebelo et al., 2014, 0.01–0.1 μM), (Herger et al., 2015, 0.005–0.05 μM). The limit of detection (LOD) of the biosensor was 0.01 μM, which can be compared to with those of previous biosensors (Herger et al., 2015, 50 pM), (Rebelo et al., 2014, 16,000 pM), (Ozkutuk et al., 2016, 1350 pM), (Nguy et al., 2017, 1000 pM) (Table 4). The addition of sarcosine in sera at final concentrations of 0.5 μM and 1.0 μM has resulted into 94.22% and 97.81% recovery as measured by the present biosensor showing the reliability of method (Supplementary Table 1). The coefficient of variation(CV) for sarcosine quantification in within and between batch sera samples by the present biosensor were 0.083% and 0.067% respectively (Supplementary Table 2), showing the high reproducibility and consistency of the method. This could be possible due to direct applications of SOxNPs for construction of enzyme electrode.

3.6 Correlation

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To evaluate the accuracy of the present biosensor, sarcosine was quantified in sera samples from apparently healthy persons and persons diagnosed with prostate cancer, by the present biosensor and standard immune kit method and a correlation curve was plotted between these values (Fig. 4d). The value of correlation coefficient (R^2), as calculated from regression equation, was found to be 0.98. This value of R^2 reveals the high accuracy of the method.

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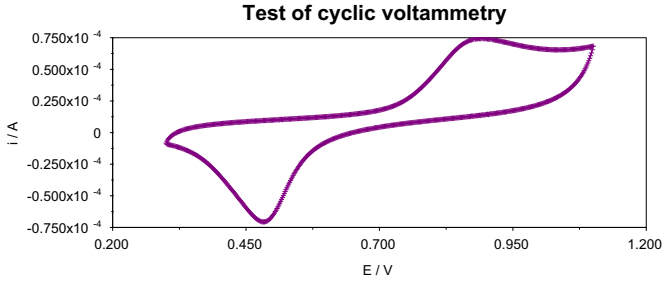
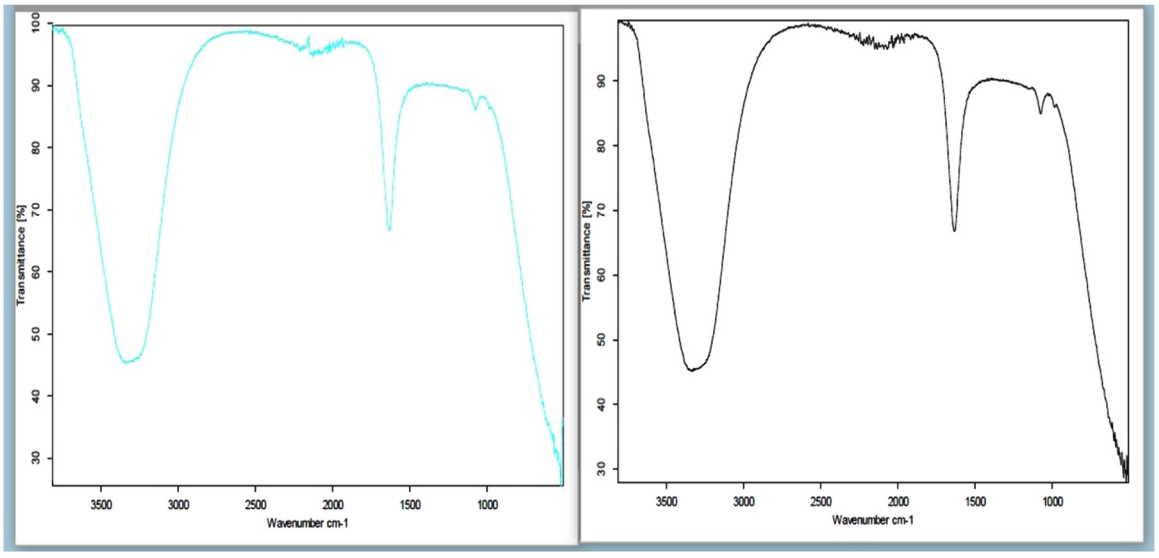


Fig. 2. Cyclic voltammogram for SOxNPs/AuE in 25 ml 0.1 M sodium phosphate buffer (pH= 6.5) containing 2 mM (0.1 ml) sarcosine at a scan rate of 20 mVs^{-1}.



(c)

Fig. 3. (c) FTIR spectra of native SOx and SOxNPs (Kumar et al., 2017).

3.7 Interference study and selectivity Line 1–2

Re-written text

The addition of some possible interfering metabolites such as citric acid, glutamic acid, uric acid ascorbic acid and urea in the reaction buffer individually, caused inhibition of 4.20%, 2.70%, 1.50%, 3.80% and 2.80% respectively at their physiological concentrations which showed practically no impact on biosensor response under the standard assay conditions. As these side products (ascorbic acid, uric acid etc) are found in blood, their effect on biosensor performance was studied. These products did not affect the performance of biosensor, due to the substrate specificity of present sarcosine biosensor. The biosensor optimum working conditions are not suitable for the other metabolites so, it works specifically on sarcosine (Kumar et al., 2017).

3.8 Storage stability of SOxNPs/Au electrode

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A 10% decrease in the initial activity of SOxNPs/Au electrode after its daily use during a period of 180 days, while being stored dry at 4 °C (Supplementary Fig. 5), exhibited a higher storage stability of the present electrode over earlier electrodes (Rebelo et al., 2014 and Nguy et al., 2017, 60 days , Ozkutuk et al., 2016, 165 days) but similar to that by Narwal et al. (2018). It was due to the use of enzyme nanoparticles and their direct/covalent immobilization onto Au electrode (Narwal et al., 2018).

Table 4 summarizes a comparison of various analytic characters of the earlier sarcosine biosensors with those of present biosensor, which reveals the superiority of present biosensor over previous biosensors.