

Supplementary Information

Single-electrode electrochemical system for multiplex electrochemiluminescent analysis based on resistance induced potential difference

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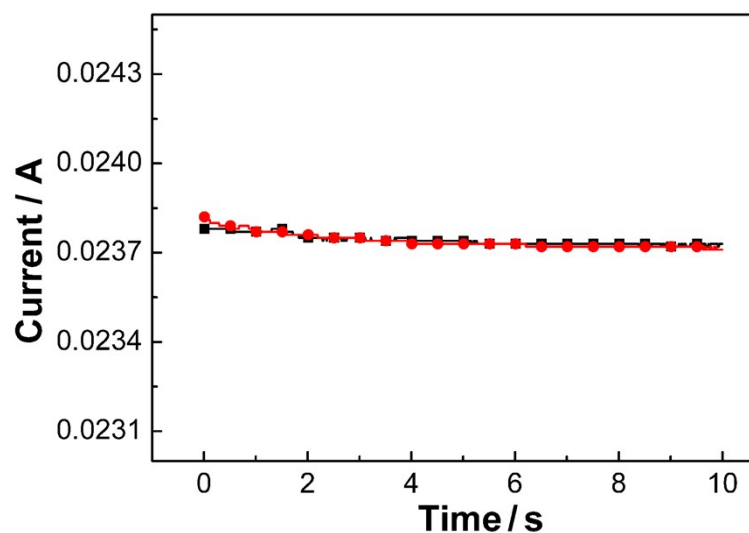


Fig. S1 Current-time curves on the SEES in the absence of any solution (black line), and in the presence of 0.1 M carbonate buffer (pH 11.0) containing 10 μ M of luminol and 0.1 mM of H_2O_2 (red line). The voltage applied to the SEES is 2.0 V.

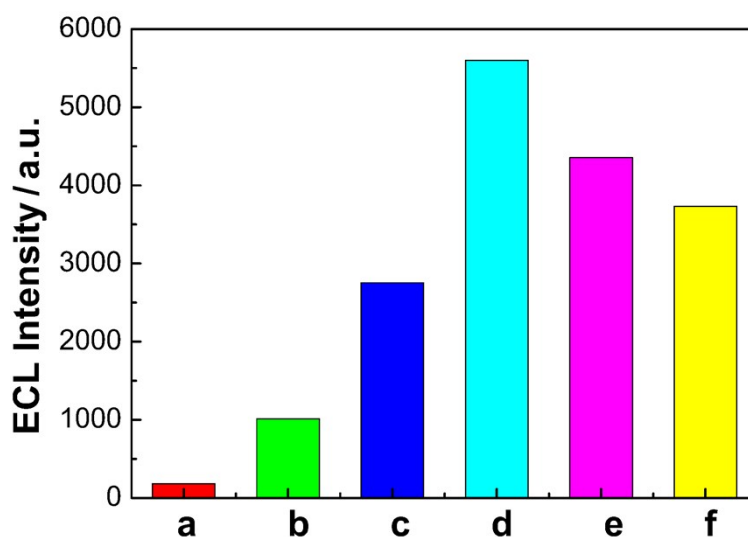


Fig. S2 Effect of ITO resistance on the ECL intensity. The column from a to f represents different ITO resistance (Ohms/square): 10, 20, 50, 100, 200, 500. 0.1 M, pH 11.0 carbonate buffer solution (CBS); $c(\text{luminol})$: 10 μ M; $c(H_2O_2)$: 1.0 mM; PMT: 650V; the voltage applied to the SEES is 2.0 V.

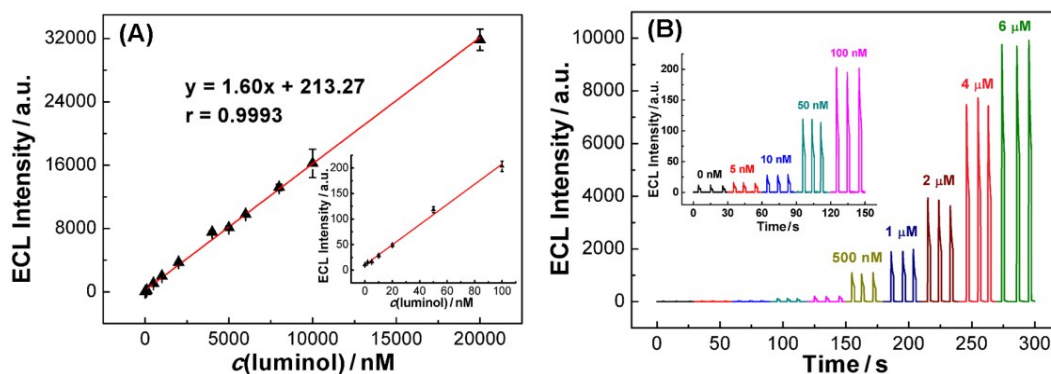


Fig. S3 Dependence of the ECL intensities on the concentrations of luminol. (A) Linear calibration curve of luminol. (B) ECL profiles with three consecutive measurements at different concentrations of luminol. Inset is the enlarged one from 0 to 100 nM. 0.1 M carbonate buffer, pH 11.0; $c(\text{H}_2\text{O}_2)$: 1.0 mM; PMT: 700V; the voltage applied to the SEES is 2.0 V.

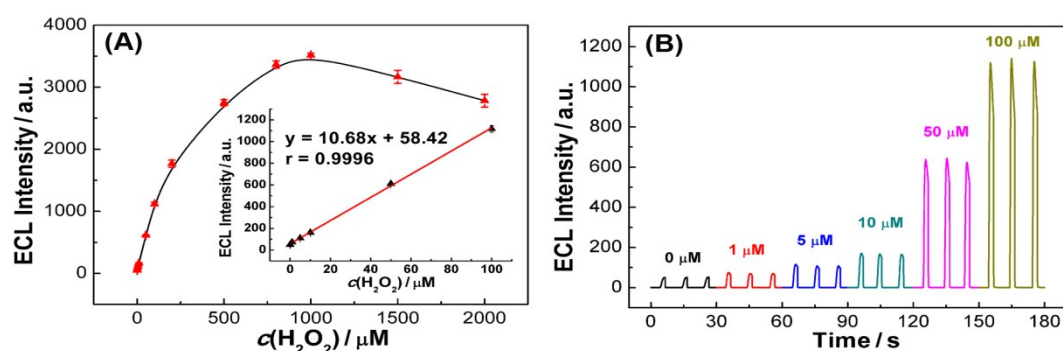


Fig. S4 ECL detection toward hydrogen peroxide using SEES having one microelectrochemical cell. (A) Dependence of ECL intensity on the concentrations of H_2O_2 . Inset: Linear calibration curve of H_2O_2 from 1.0 to 100 μM . (B) ECL profiles with three consecutive measurements at different concentrations of H_2O_2 . 0.1 M carbonate buffer, pH 11.0; $c(\text{luminol})$: 10 μM ; PMT: 600V; the voltage applied to the SEES is 2.0 V.

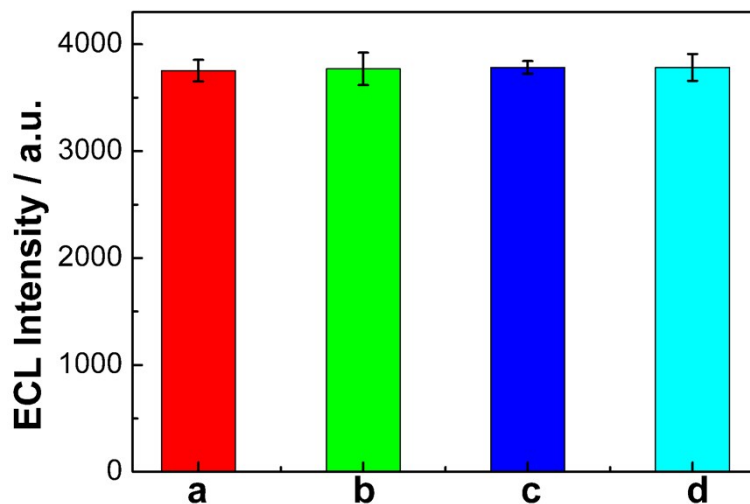


Fig. S5 Dependence of the ECL intensities on the concentrations of carbonate buffer solution (pH 11.0): a, 50 mM; b, 100 mM; c, 101 mM; d, 110 mM. $c(\text{luminol})$: 10 μM ; $c(\text{H}_2\text{O}_2)$: 0.1 mM; PMT: 700V; the voltage applied to the SEES is 2.0 V.

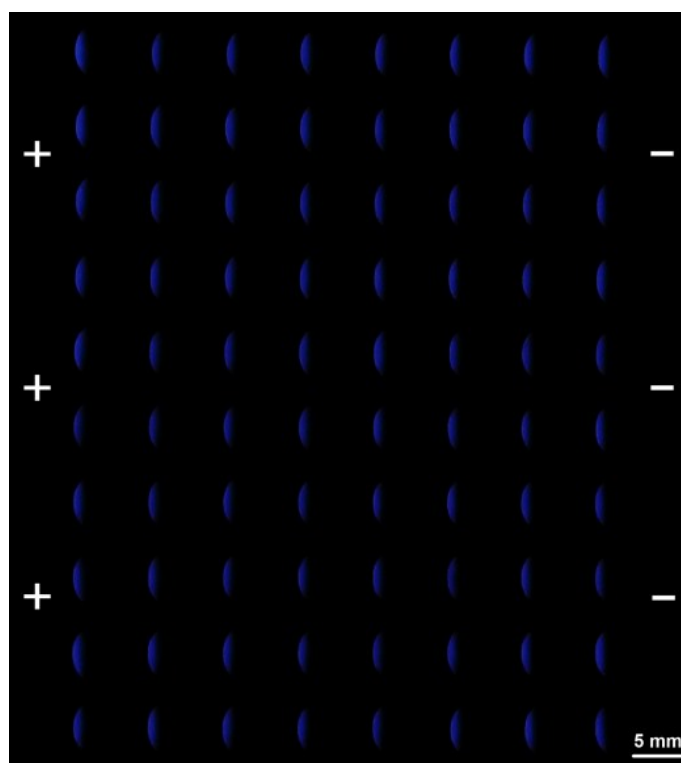


Fig. S6 Performance of the SEES with eighty microelectrochemical cells. ECL emission images of luminol/ H_2O_2 system using SEES with eighty (8×10) microelectrochemical cells. 0.1 M carbonate buffer, pH 11.0; $c(\text{luminol})$: 1.0 mM; $c(\text{H}_2\text{O}_2)$: 0.1 mM; the voltage applied to the SEES is 15 V.

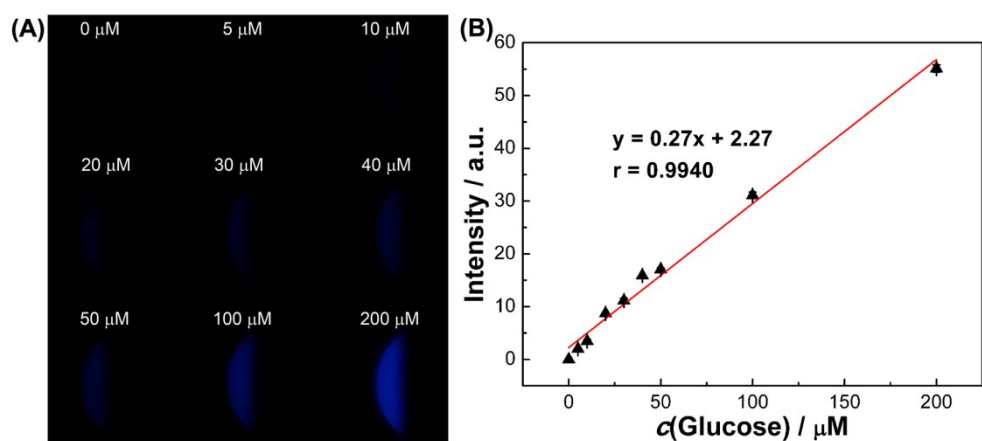


Fig. S7 ECL analysis of glucose using SEES containing nine microelectrochemical cells. (A) ECL emission images of luminol/glucose oxidase/glucose system with different concentrations of glucose using SEES containing nine microelectrochemical cells. (B) Visualized quantitative detection of glucose. 0.1 M carbonate buffer, pH 11.0; $c(\text{luminol})$: 1.0 mM; the voltage applied to the SEES is 10 V.

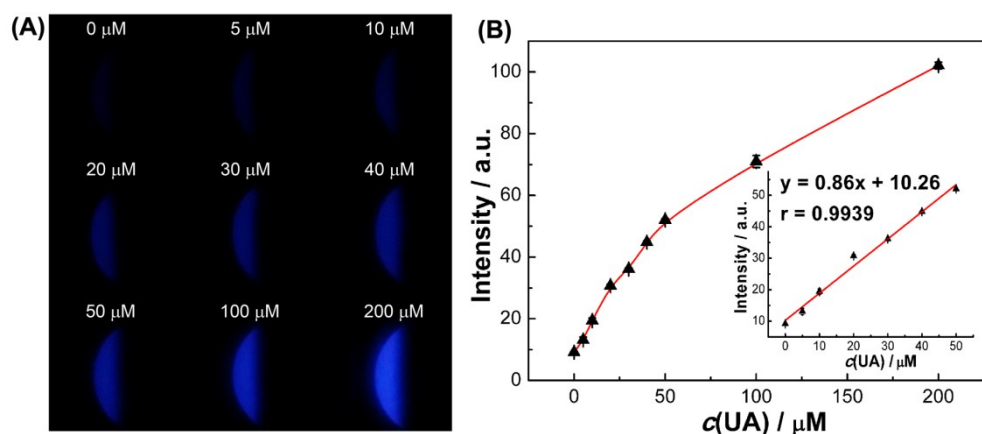


Fig. S8 ECL analysis of uric acid using SEES containing nine microelectrochemical cells. (A) ECL emission images of luminol/uricase/uric acid system with different concentrations of uric acid (UA) using SEES containing nine microelectrochemical cells. (B) Visualized quantitative detection of uric acid. 0.1 M carbonate buffer, pH 11.0; $c(\text{luminol})$: 1.0 mM; the voltage applied to the SEES is 10 V.