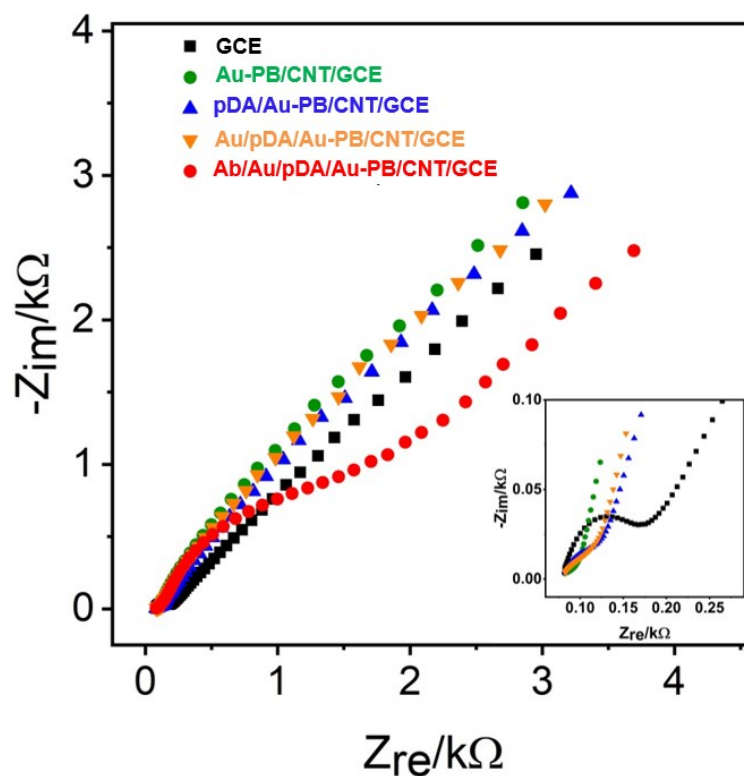
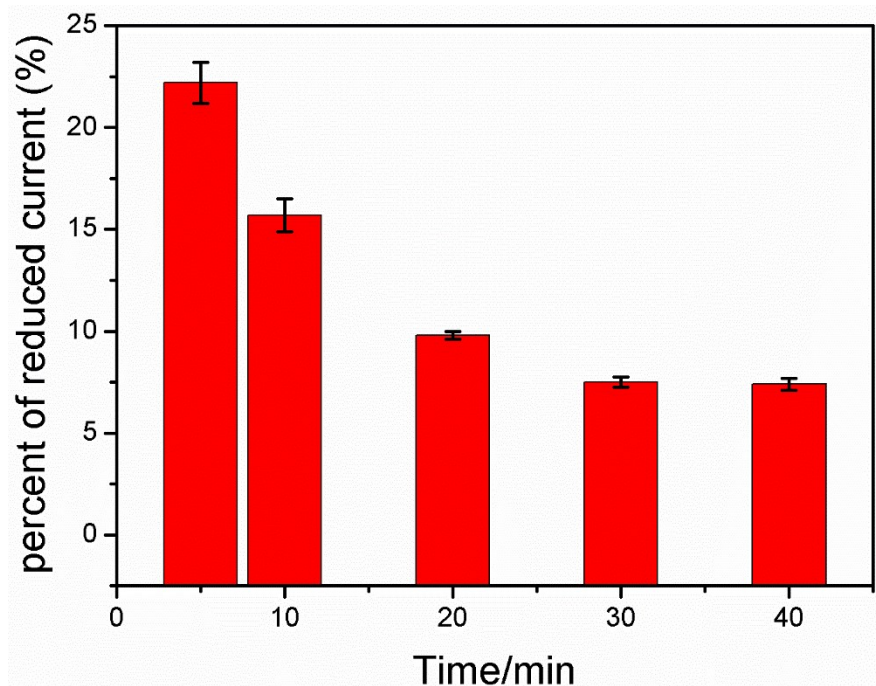


## Supplementary materials

### Figures



**Fig. S1** EIS of different electrodes measured in  $\text{Fe}(\text{CN})_6^{3-/4-}$  (2.0 mM) containing 0.1 M KCl. The inset shows the enlarged view of the EIS curves obtained on different electrodes (except for Ab/Au/pDA/Au-PB/CNT/GCE) in the low-frequency region.



**Fig. S2** The percent of reduced current (%) obtained by 20 continuous scans on pDA/Au-PB/CNT/GCE prepared using different polymerization time of dopamine.

## Tables

**Table S1.** Comparison of different sensors for CEA detection

<b>Sensing element</b>	<b>Method</b>	<b>Linear range (ng/mL)</b>	<b>LOD (pg/mL)</b>	<b>Ref.</b>
Ab/Ag <sub>2</sub> S@ZnO/AuNPs	colorimetry	0.1-20	50	26
Ab/chitosan-AuNPs/GCE	electrochemistry	0.5-60	100	27
Ab/chitosan glutaraldehyde	colorimetry	0.1-20	30	28
Ab/Ag-Co <sub>3</sub> O <sub>4</sub> @N-doped graphene oxide/GCE	electrochemistry	0.001-200	0.18	31
TiO <sub>2</sub> -AuNPs-carbon paste electrode	electrochemistry	0.01-20	10	29
Ab/polyethyleneimine/AuNPs@nafion/K <sub>3</sub> Fe(CN) <sub>6</sub> @chitosan/GCE	electrochemistry	0.01-150	3	32
Ab/AuNPs/Au electrode	electrochemistry	0.5-20	100	30
Ab/Au/pDA/Au-PB/CNT/GCE	electrochemistry	0.005-50	3.3	this work