

Supplementary data

A novel amperometric biosensor based on gold nanoparticles anchored on reduced graphene oxide for sensitive detection of L-lactate tumor biomarker

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Supplementary data

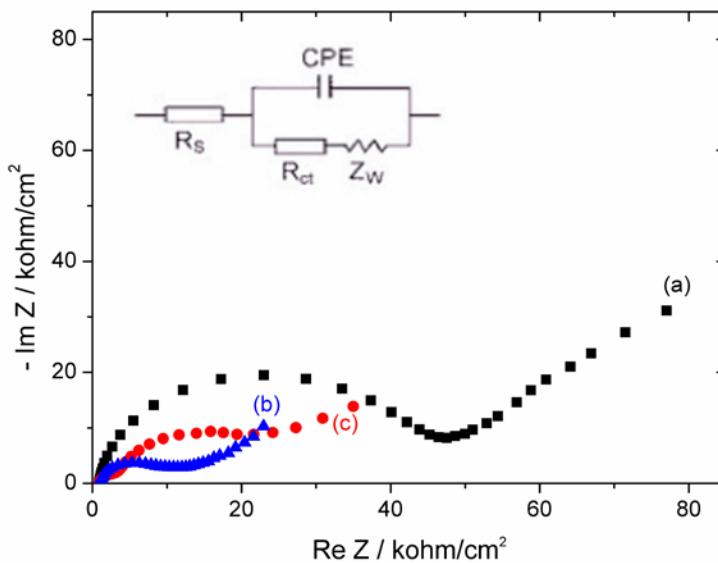


Fig. S1. Nyquist plots for bare SPCE (a), RGO-AuNPs/SPCE (b) and respectively LDH/RGO-AuNPs/SPE (c) in 5 mM $\text{Fe}(\text{CN})_6^{3-/\text{4}-}$, containing 0.1 M KCl (frequency range 100 kHz–0.01 Hz, perturbation signal 10 mV, OCP). Inset: Randles circuit.

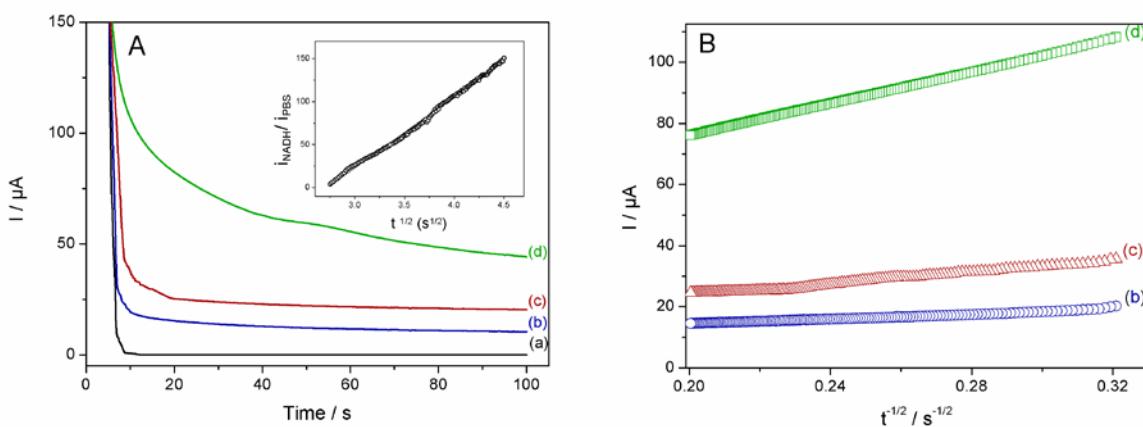


Fig. S2. Chronoamperograms using RGO-AuNPs/SPE sensor in absence (a), and in the presence of NADH 1 mM (b), 2 mM (c), 5 mM (d) (PBS, pH = 7.5). Inset: plot $i_{\text{cat}}/i_{\text{buffer}}$ vs. $t^{1/2}$ derived from chronoamperometric data for NADH 5 mM (d) and buffer (a). (B) Linear segments of the plot i vs. $t^{-1/2}$ for NADH 1 mM (b), 2 mM (c) and 5 mM (d).

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Table S1. Performances of some L-lactate enzyme biosensors reported in the literature.

Interface	Sensitivity ($\mu\text{A}/\text{mM}$)	Linear range (μM)	Detection limit (nM)	References
PVS/GCE	-	$500 - 6 \cdot 10^3$	100	(Chaubey et al. 2000)
O-phenylene diamine/graphite	-	$50 - 10^3$	$< 50 \cdot 10^3$	(Vo-Dinh and Cullum 2000)
pTTCA/MWCNT/Au	10.6	5 - 90	1000	(El-Ansary and Faddah 2010)
Polyvinylpyrrolidone/ carbon electrode	0.0626	up to $2 \cdot 10^3$	1.1×10^5	(Yoon and Kim 1996)
Silica sol-gel/Au	104	2 - 30	800	(Di et al. 2007)
Polysulfone/CNT/ SPCE	7.334	1 - 20	370	(Pérez et al. 2012)
ZnO nanorods/Au	1832	0.2 - 0.8	4.73	(Nesakumar et al. 2014)
RGO-AuNPs/SPCE	19 $(154.45 \mu\text{A}/\text{mM} \cdot \text{cm}^2)$	$10 - 5 \cdot 10^3$	130	This work

PVS: Poly(vinylsulfonate); GCE: Glassy carbon electrode; pTTCA/MWCNT: Poly-5,20-50,200-terthiophene-30-carboxylic acid/multiwalled carbon nanotubes; Au: gold electrode

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