Electronic Supplementary Material (ESI) for Analyst.

SUPPORTING INFORMATION

A Nanosecond Pulsed Laser-Ablated MWCNT-Au Heterostructure: An Innovative Ultra-Sensitive Electrochemical Sensing Prototype for the Identification of Glutathione

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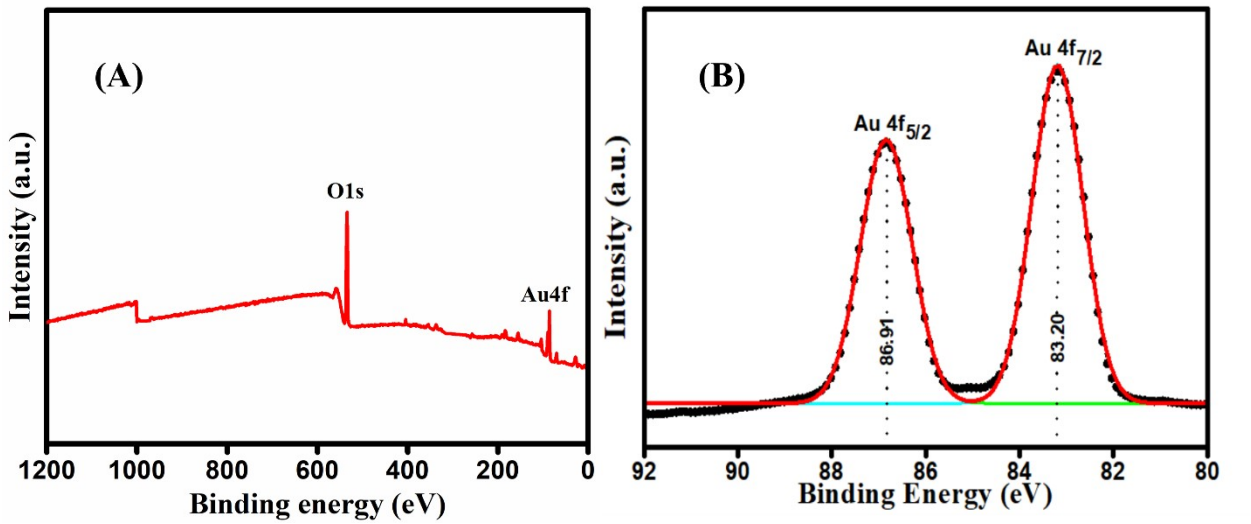

Fig. S1. LAAu XPS spectra: (A) Survey spectrum, (B) Au4f high-resolution spectra.

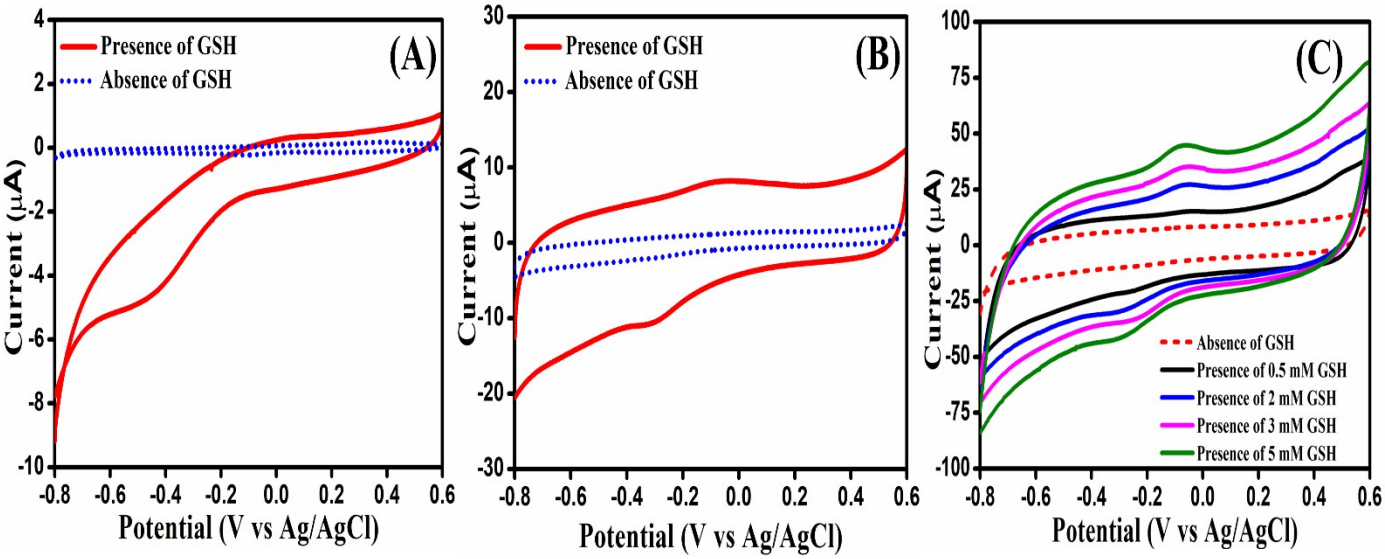

Fig. S2. CVs of LAAu/GC (A), LAMWCNT/GC (B), with and without 0.5 mmol/L GSH and LAMWCNT-Au/GC (C) at different concentrations (0.5, 2, 3, 5 mmol/L) in 0.1 mol/L PBS (pH=7) at a scan rate of 50 mV/s.

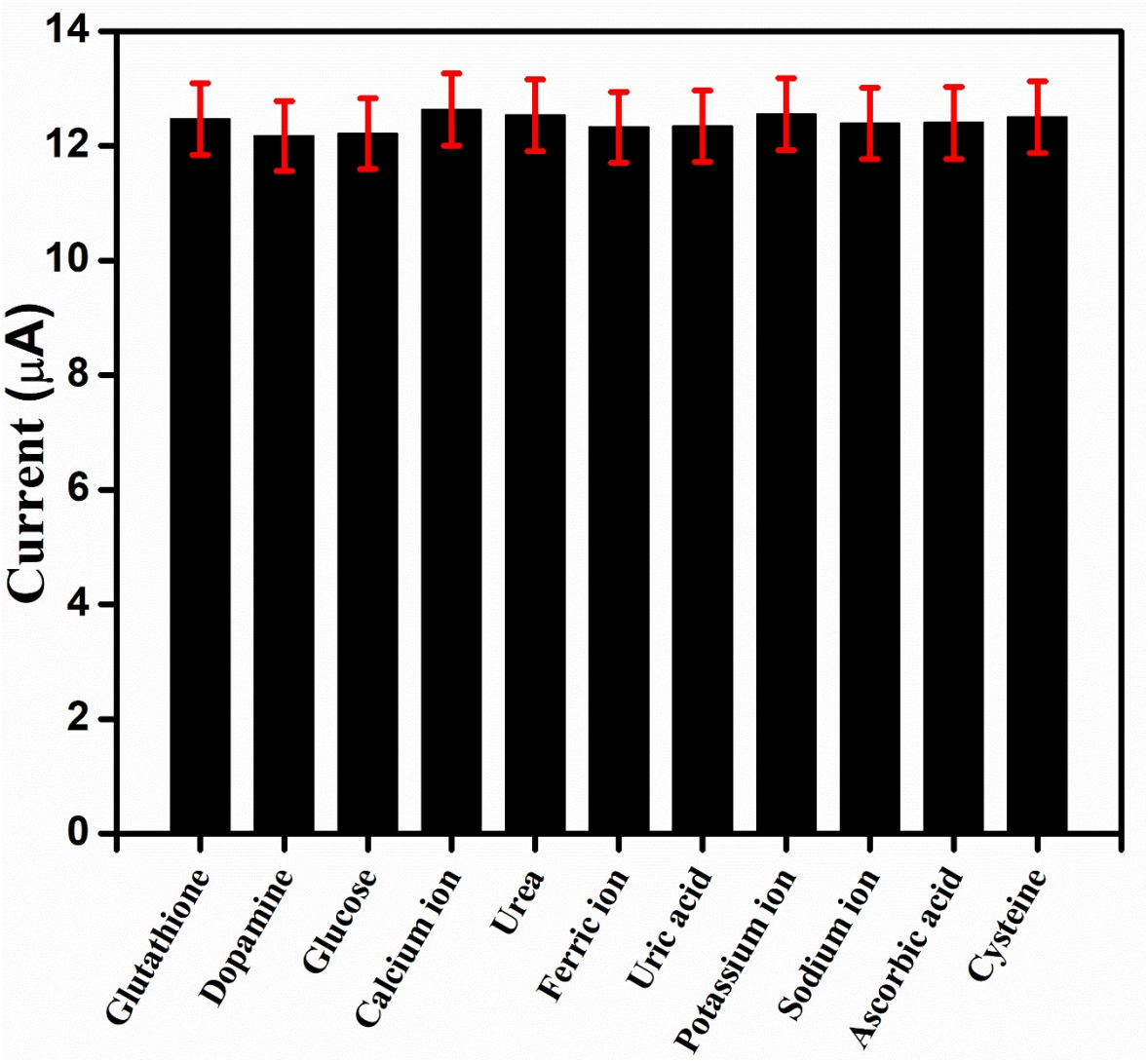

Fig. S3. Influence of interferences of foreign species (5 mmol/L each) on the peak currents of 0.5 mmol/L GSH in 0.1 mol/L PBS (pH =7) at LAMWCNT-Au modified electrode.

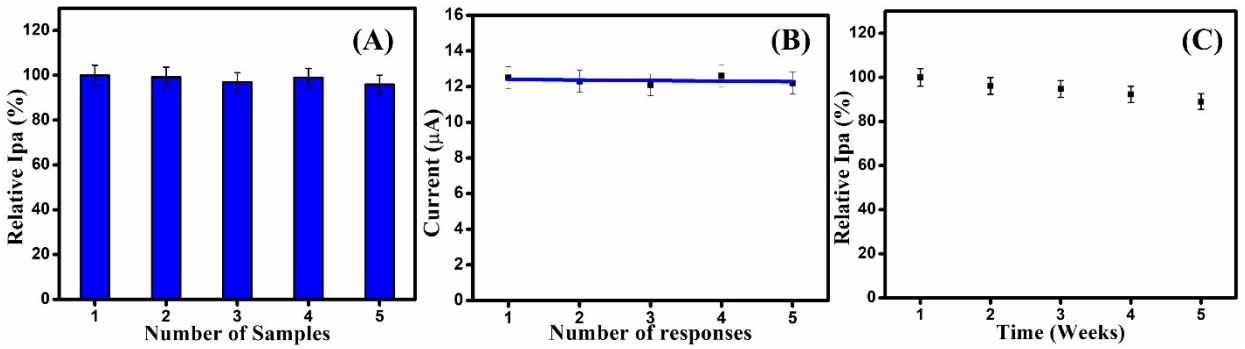

Fig. S4. (A) Reproducibility of the different LAMWCNT-Au electrodes used in the detection of 0.5 mmol/L GSH in 0.1 mol/L PBS solution (pH 7.0). **(B)** Repeatability of the prepared LAMWCNT-Au electrodes used in the detection of 0.5 mmol/L GSH in 0.1 mol/L PBS solution (pH 7.0). **(C)** Stability of the prepared LAMWCNT-Au electrode (kept at a temperature of 4^0C) used in the detection of 0.5 mmol/L GSH in PBS solution (0.1 mol/L pH 7.0) over 5 weeks.

Table S1. R_s and R_{ct} values for all four modified sensors.

Sensor	R_s (Ω)	R_{ct} (Ω)
LAMWCNT-Au/GCE	0.01568	0.02116
LAMWCNT/GCE	0.19391	0.08584
LAAu/GCE	1.28692	0.3925
Bare/GCE	2.74516	2000

Table S2. Comparison of detection limit using LAMWCNT-Au/GC electrode to various modified electrodes using the amperometric method previously reported in the literature.

Electrodes	Dynamic Range (µmol/L)	Limit of Detection (µmol/L)	References
GSHOx/AgNPs/c-MWCNTs/PANI/Au	0.3 - 100	0.3	1
AuNPs/TiO2	33.2 - 740.7	1.3	2
Ni-Al LDHs/ MWCNTs/GCE	1.2 - 1630	0.7	3
GO/GCE	5 - 875	5	4
SiNPs/GQDs/ GCE	0.5 – 7	0.5	5
LAMWCNT-Au/GCE	0.1 – 9	0.93	This Work

Table S3. Determination of GSH levels in real samples GSH commercial tablets using the LAMWCNT-Au modified electrode (n = 3)

Samples	**Added (µmol/L)**	**Original (µmol/L)**	**Found (µmol/L)**	**Recovery (%)**
GSH Tablets (Labeled: 500 mg/mL)	-	100	99±1.3	99.2
	100	200	197±2.1	98.3
	100	300	302±1.6	102.4
	100	400	403±1.9	103.2
	100	500	501±2.0	101.1

References

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